

# Surgical management of female pelvic organ prolapse with and without urinary incontinence

## A single center experience

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### Abstract

The study reports a single center experience with surgical management of female pelvic organ prolapse (POP) with and without urinary incontinence.

Between January 2006 and July 2016, 93 consecutive patients with anterior and/or apical symptomatic POP underwent abdominal sacrocolpopexy (ASC) or laparoscopic sacrocolpopexy (LSC) or pubovaginal cystocele sling (PCS); 25 patients had concomitant stress urinary incontinence (SUI). Subjective outcome was assessed by the Pelvic Floor Impact Questionnaire (short form) (PFIQ-7) investigating bladder, bowel and vaginal functions, sexual activity, and daily life. Objective outcomes included the POP anatomic correction by Baden Walker HWS classification, urinary tract infection (UTI) rates, urge urinary incontinence (UUI), and SUI rates. Data were prospectively collected.

Forty-three patients underwent PCS, 29 ASC, and 21 LSC. Mean follow-up was  $54.88 \pm 33.1$ ,  $28.89 \pm 23.5$ , and  $16.8 \pm 11.3$  months for PCS, ASC, and LSC, respectively. POP recurrence occurred in 10.5%, 7.5%, and 0% while de novo (ie, in untreated compartment/s) POP occurred in 15.8%, 7.4%, and 4.8% of patients who have undergone PCS, ASC, and LSC, respectively. Kaplan–Meier estimates of POP-free survival showed no difference among the 3 procedures. All procedures significantly reduced PFIQ-7 scores improving quality of life and the rates of recurrent UTIs and concomitant UUI. PCS cured all cases with concomitant SUI; de novo SUI occurred only in 7.4% and 4.8% of patients who have undergone ASC and LSC, respectively. Mean surgical time was significantly shorter for PCS compared to ASC and LSC ( $P = .0001$ ), and for ASC compared to LSC ( $P = .004$ ); there was no difference in postoperative pain and hospital stay. Compared to ASC/LSC, PCS involved a higher rate (27.9% vs 6%;  $P = .01$ ) of minor complications, mainly transient urinary retention, and a lower rate (0% vs 8%;  $P = .06$ ) of complications requiring surgery.

In this single center experience, PCS was not only provided similar subjective and objective results than ASC and LSC but also able to correct concomitant SUI without causing de novo SUI and was safer than other 2 techniques, in female POP repair.

**Abbreviations:** ASC = abdominal sacrocolpopexy, HWS = half way classification system, LSC = laparoscopic sacrocolpopexy, PCS = pubovaginal cystocele sling, PFIQ-7 = Pelvic Floor Impact Questionnaire (short form), POP = pelvic organ prolapse, SC = sacrocolpopexy, SUI = stress urinary incontinence, UTI = urinary tract infection, UUI = urge urinary incontinence.

**Keywords:** cystocele, prolapse, stress urinary incontinence, surgery, urinary bladder diseases

## 1. Introduction

Anterior colporrhaphy (AC) remains the most common operation for anterior pelvic organ prolapse (POP) repair<sup>[1]</sup> but failure rates of 40% to 60% have been reported following this procedure

as it uses weakened tissue and addresses only midline defects with no apical support.<sup>[2]</sup> Thus synthetic grafts have been launched with the aim to elude failures related to the use of weak native tissue.

Mesh abdominal sacrocolpopexy (ASC) represents the mainstay of transabdominal repairs as it provides the highest success rates for apical/vaginal vault POP with durable results; however, these benefits must be balanced against a prolonged operating time, a long time to return to daily activities, increased costs, and a nearly 20% risk of de novo stress urinary incontinence (SUI) because of the change in the vaginal axis.<sup>[3,4]</sup> The minimally invasive approach, either laparoscopic sacrocolpopexy (LSC) or robot-assisted sacrocolpopexy, seems to provide better postoperative outcome in terms of pain and return to daily activities but does not reduce the risk of de novo SUI.<sup>[5]</sup>

Transvaginal mesh surgery avoids major abdominal surgery while providing an effective means of correcting anterior and apical POP as well as preventing or, when existing, correcting SUI. Comparing to AC, transvaginal mesh surgery shows a higher success rate in short-term outcome but this procedure is more recurrently complicated and followed by adverse events, mainly associated to the mesh.<sup>[3,4]</sup> In this regard, the United States Food and Drug Administration alerted about the risk related to

Editor: Giuseppe Lucarelli.

LC and VM contributed equally to this work.

The authors have no funding and conflicts of interest to disclose.

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Medicine (2017) 96:39(e7914)

Received: 3 July 2017 / Received in final form: 14 July 2017 / Accepted: 3 August 2017

<http://dx.doi.org/10.1097/MD.0000000000007914>

transvaginal meshes and their severe and frequent complications in POP repair.<sup>[6]</sup>

To keep away from utilize of both weakened autologous tissues and synthetic meshes, and to be able to correct concomitant SUI, we developed a modified pubovaginal sling procedure (pubovaginal cystocele sling [PCS]) involving a large trapezoidal autologous rectus fascia graft.<sup>[7]</sup> In the first 30 patients, we treated with anterior and/or apical POP, 14 with and 16 without concomitant SUI, the PCS proved to be safe and effective, with durable results at mean follow-up of more than 5 ears.<sup>[7]</sup>

In the present single center study, we compared the performance of PCS and sacrocolpopexy (SC), either open abdominal or laparoscopic, in real-life surgical management of POP.

## 2. Material and methods

Between January 2006 and July 2016, 93 consecutive patients with grade 2 to 4 (Baden Walker half way classification system [HWS]) anterior and/or apical symptomatic POP underwent ASC, LSC, or PCS. One of us (VM) assessed and graded POP using the HWS classification pre- and postoperatively with patients having a full bladder and placed in gynecological position. Urinary incontinence was clinically classified on the basis of the International Continence Society (ICS) definition. All patients underwent a stress test in the supine position at physiologic bladder capacity, before and after prolapse reposition both with the fingers and using a posterior blade of a Sims speculum placed in the anterior vaginal fornix; stress test was considered positive if leakage occurred with a cough or Valsalva manoeuvre. All patients underwent a urodynamic test (always performed by VM) including uroflowmetry, cystometry, pressure/flow study, urethral profilometry, and Valsalva leak point pressure (VLPP) performed at 200 cc with the patient in a semirecumbent position with and without POP repositioning (according to ICS 2002 guidelines available online).

Subjective outcome was assessed by the International Continence Society–recommended disease specific questionnaire for quality of life Pelvic Floor Impact Questionnaire (short form) or PFIQ-7, which assesses bladder, bowel and vaginal functions, including sexual activity, and how symptoms affect daily life, relationships, and feelings, so the quality of life.<sup>[8]</sup>

Objective outcome included: anatomical correction (POP free was defined as no vaginal defect or HWS grade 1); SUI rate; urge urinary incontinence (UUI) rate; and recurrent urinary tract infections (UTIs, defined as a symptomatic infection with positive urine culture occurring 2 or more times on 6 months or 3 or more times a year). All data were prospectively recorded. Patients were seen at 1, 3, 6, and 12 months postoperatively and then yearly, evaluating personal history and symptoms, PFIQ-7 questionnaire, vaginal profile, stress test with full bladder, urine analysis and urine culture, postvoid residual urine, voiding diary, and 24-hours pad test particularly to evaluate urinary incontinence. The study was approved by the local ethical committee and all patients signed an informed written consent to be enrolled.

### 2.1. Surgical techniques

The choice of the surgical procedure was made following a clinical discussion among the female pelvic surgery team members (GC, LC, and VM) on the basis of symptoms and urodynamic data. Patients with concomitant SUI were scheduled for the PCS procedure unless correction of a concomitant posterior defect was deemed necessary. Patients without SUI were

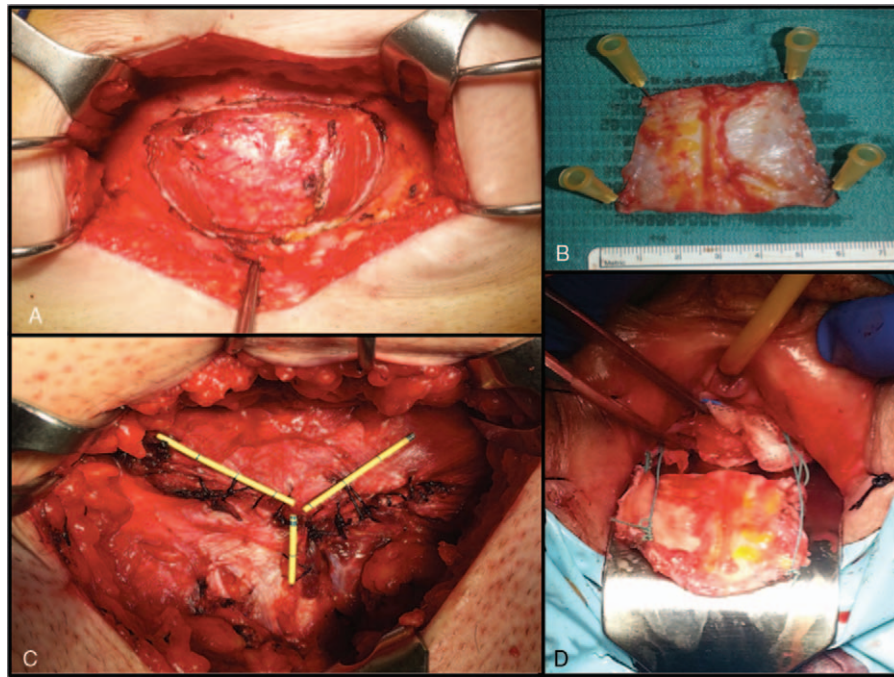
scheduled for ASC, LSC, or PCS on the basis of the consultant they were referred to, with GC favoring ASC and LC favoring PCS and LSC. All 3 procedures were considered effective in curing both anterior and/or apical defect, providing anterior vaginal wall dissection was carried out down to the bladder trigone in SC and the base of the graft was well fixed to the cervical fold in PCS. By doing so, both procedures provide effective anterior-cranial elevation of the anterior vaginal wall, up to making it parallel to rectus muscles. Independently on the surgical choice, all procedures were performed by at least 2 of the 3 team members to guarantee standardization.

The PCS has been previously described.<sup>[7]</sup> Under spinal anesthesia, the patient is placed in the dorsal lithotomy position and an inverted-U colpothomy carried out on the anterior vaginal wall, approximately 1 cm from the urethral meatus. The plane between the pubo-cervical fascia and the anterior vaginal wall is developed by blunt dissection till reaching the cervical fold medially and the paracervical spaces laterally. Meanwhile, another surgeon harvests, through a Pfannenstiel incision, a trapezoidal (major base 6 cm, minor base 4 cm, and height 5 cm) rectus fascia graft, mobilizing it from the overlying tissue wide enough to leave at least 3 cm from the edges of the graft (Fig. 1A, B). The Retzius space is entered and the endopelvic fascia cleaned bilaterally in order to pass the Raz needle under direct vision, thus avoiding the large veins underneath. The surgeon's index finger kept at the level of mid-urethra and of the paracervical space indicates the place for correct passage of Raz needle. Four instead of 2 woven polyester 1/0 stitches are passed; the proximal part (with the needle) is kept on the vaginal side to anchor the four corners of the graft, while the distal part is passed above rectus muscles before closing their fascia. The gap in rectus muscles fascia is closed starting from the 2 corners of the major base to the midline and the remaining vertical gap is closed with 1 of these 2 sutures, thus resulting in a figure of Y closure to reduce tension in the cranio-caudal direction (Fig. 1C). Cystoscopy is performed to rule out bladder or urethral perforation. Using 3/0 polyglactin stitches, the apical part of the graft is fixed to mid-urethra whereas the basal one is fixed at the level of the cervical fold. A size 10 Hegar dilator is introduced into the urethra; the 2 apical (mid-urethral) stitches are tied together above the rectus fascia in a tension-free fashion, whereas the 2 basal ones are tied together above the rectus fascia with tension in order to suspend the cervical fold (Fig. 1D). Straightening of the Hegar dilator indicates adequate suspension.

The ASC was carried out through a midline umbelico-pubic incision. Two double monofilament large-pore polypropilene meshes were used, 1 on the anterior and 1 on the posterior vaginal wall; in the absence of the uterus both meshes had a rectangular shape, whereas in the presence of the uterus the anterior had a Y-shape and the 2 proximal arms were passed around the uterus through an avascular point of the broad ligaments.

The LSC was carried out using 4 ports and a single double monofilament large-pore polypropilene mesh, unless a posterior defect had to be corrected; when the uterus was present, the mesh was passed on its right side through the avascular point of the broad ligaments. For both ASC and LSC, the meshes were fixed to vaginal wall and sacrum using 2/0 woven polyester nonabsorbable stitches; the peritoneum was carefully closed over the meshes and no drain was used.

At the end of all kind of procedure, a 20Fr Foley catheter and a vaginal iodized pack were left in place. The pack was removed on postoperative day 1 while the Foley catheter on postoperative day 2. Women were allowed to stand on postoperative day 2 and



**Figure 1.** (A, B) A large trapezoidal (base 6 cm, apex 4 cm, and height 5 cm) rectus fascia graft is harvested through a Pfannenstiel incision during pubovaginal cystocele sling (PCS) procedure. (C) Y closure of rectus muscles fascia. (D) Using 3/0 polyglactin stitches, tied together above the rectus fascia, the apical part of the graft is fixed to mid-urethra whereas the larger basal one is fixed at the level of the cervical fold, reducing prolapse and suspending urethra during the last phase of PCS procedure.

discharged home after a successful voiding trial. Lifting objects greater than 3 kg and sexual intercourse were forbidden for the 1st 4 weeks. Postoperative pain was assessed by delivering patients the 0–10-point linear visual analog scale at 24 and 48 hours postoperatively.

## 2.2. Statistical analysis

Continuous data are reported as means  $\pm$  standard deviations (SDs) or median values as appropriate; those with normal distribution according to the Skewness and Kurtosis test were compared by Student *t* test for paired or unpaired data when comparing 2 groups, and with the ANOVA test when comparing multiple groups. Continuous data with a nonparametric distribution were compared by the Mann–Whitney *U* test for independent groups. Differences in rates were compared by the Fisher exact test or the chi-square test. Disease-free survival was evaluated by the Kaplan–Meier estimator with differences among groups being tested for significance using the Log-rank test. Significance was set at  $P < .05$ . Statistical analysis was carried out using the MedCalc 16.8 Software (MedCalc, Ostend, Belgium).

## 3. Results

Patients' characteristics are summarized in Table 1. Forty-three patients underwent PCS, 29 ASC, and 21 LSC. Two patients in the PCS group but none in the ASC and LSC groups had concomitant hysterectomy.

Mean follow-up was  $54.88 \pm 33.1$  months (range 3–118),  $28.89 \pm 23.5$  months (range 4–70), and  $16.8 \pm 11.3$  months (range 4–41) for PCS, ASC, and LSC, respectively. Six patients were lost at follow-up, 4 in the PCS group, 2 in the ASC group, and none in the LSC group. Another patient was excluded as she

was found with a Surgicel granuloma mimicking an ovarian cancer 6 months after PCS<sup>[10]</sup>; she underwent surgery leading to iatrogenic damage of the PCS with consequent POP recurrence.

POP recurrence occurred in 10.5%, 7.5%, and 0% while de novo (ie, in untreated compartment/s) POP occurred in 15.8%, 7.4%, and 4.8% of patients who have undergone PCS, ASC, and LSC, respectively. Kaplan–Meier estimates of POP-free survival of all patients distributed in the time show no difference among the procedures, over the different single mean rates (Fig. 2).

All procedures provided a statistically significant improvement in the PFIQ-7 score, with the LSC performing significantly better than PCS and ASC at last follow-up (Fig. 3A). To overcome the potential impact of different mean follow-up and number of POP recurrences on PFIQ-7 scores, we analyzed the scores of patients without POP recurrence (Fig. 3B); LSC again performed significantly better than PCS and ASC at last follow-up but the difference in scores was much lower.

The PCS procedure required a significantly ( $P < .0001$ , ANOVA test) shorter time than ASC and LSC; ASC required a significantly shorter time than LSC (Table 1). There was no difference in postoperative pain scores and hospital stay (Table 1).

Minor complications (Table 1), namely grade I and II according to Clavien–Dindo classification,<sup>[9]</sup> were more common for the PCS than for SC, either abdominal or laparoscopic. Most of them consisted of transient urinary retention upon catheter removal, which occurred in 10 patients, all have undergone the PCS, and were successfully treated with a mean of 4 days (range 3–5) of clean intermittent self-catheterization. Wound dehiscence was seen in 2 patients, 1 in the PCS, and the other in the ASC group; none involved the underlying rectus fascia and both were successfully treated with surgical toilette and resuturing. Blood transfusion was needed in 1 patient who has undergone the PCS



**Table 1****Patients' characteristics, surgical data, and complications.**

	PCS	SC	P	ASC	LSC	P <sup>i</sup>
Patients	43	50	–	29	21	–
Age, y	59.9±9.09	63.1±7.87	.07	62±7.31	64.6±8.35	.24
BMI, kg/m <sup>2</sup>	28.4±3.54	28±3.45	.58	28.24±3.26	28.6±3.61	.98
Previous hysterectomy rate (no of pts)	32.5% (14)	28% (14)	.72	27.6% (8)	28.5% (6)	.57
Previous POP repair rate (no of pts)	23.2% (10)	20% (10)	.75	6.8% (2)	38% (8)	.02
POP compartment (no of pts)						
Anterior	43	48	.18	29	19	.89
Apical	14	21	.34	10	11	.20
Posterior	2	3	.77	1	2	.37
Recurrent UTIs rate (no of pts)	18.6% (8)	28% (14)	.40	31% (9)	23.8% (5)	.67
Concomitant UUI rate (no of pts)	23.2% (10)	28% (14)	.68	17.2% (5)	42.8% (9)	.13
Concomitant SUI rate (no of pts)	58.1% (25)	6% (3)	<.0001	6.9% (2)	4.7% (1)	.76
Operative time, min	95.1±41.07	148.2±49.93	.0001	130±42.07	168.5±46.3	.004
24 h VAS pain score	3.7±1.37	4.3±1.74	.07	4.5±1.84	3.7±1.47	.10
48 h VAS pain score	2.8±1.26	3.4±1.85	.07	3.6±2.01	3±1.51	.25
Postop hospital stay, d	4.1±1.37	4.5±3.42	.47	4.4±2.20	4.7±4.60	.76
Minor complication rate (no of pts)	27.9% (12)	6% (3)	.01	6% (3)	0	.14
Transient urinary retention	23.2% (10)	0		0	0	
Blood transfusion	2.3% (1)	4% (2)		6.9% (2)	0	
Wound dehiscence	2.3% (1)	2% (1)		3.4% (1)	0	
Major complication rate (no of pts)	0	8% (4)	.06	10.3% (3)	4.8% (1)	.50
Mesh erosion/extrusion	NA	6% (3)		10.3% (3)	0	
Ileal lesion	0	2% (1)		0	4.8% (1)	

Data are expressed as mean ± standard deviation or rate. *P*-value: PCS versus SC (Student *t* test) and ASC versus LSC (Student *t* test). ASC=abdominal sacrocolpopexy, LSC=laparoscopic sacrocolpopexy, NA=not available, PCS=pubovaginal cystocele sling, POP=pelvic organ prolapse, SC=sacrocolpopexy, SUI=stress urinary incontinence, UTI=urinary tract infection, UUI=urge urinary incontinence with detrusor overactivity, VAS=visual analog scale.

and in 2 patients who have undergone SC, both were belonging to the ASC group. One of the ASC patients needed blood transfusion because of a retroperitoneal hemorrhage diagnosed 48 hours after surgery; on 5th postoperative day she developed pulmonary embolism successfully treated by medical therapy.

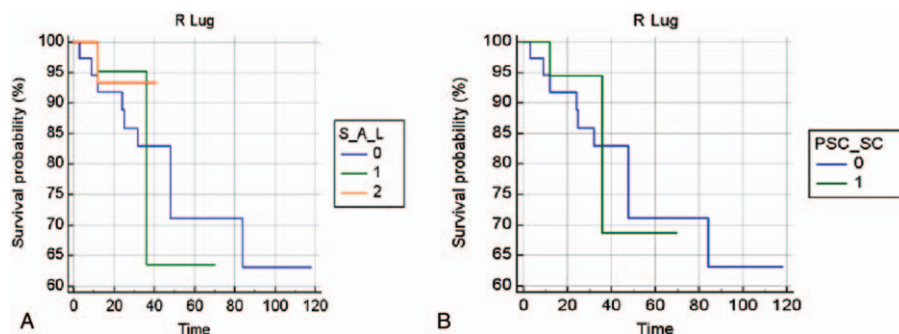
Major complications (Table 1), namely grade IIIB according to Clavien–Dindo classification,<sup>[9]</sup> were all seen in patients who have undergone SC. One patient who has undergone LSC was diagnosed on 3rd postoperative day with a minimal ileal lesion, which was successfully treated by ileorraphy. Three patients who have undergone ASC presented, 12 to 14 months after surgery, with severe mesh-associated complications, particularly 2 erosions and 1 extrusion through the vaginal wall.

All procedures reduced the rates of recurrent UTIS and concomitant UUI (Table 2). There was no difference in de novo UUI rate among the 3 procedures; all cases were successfully

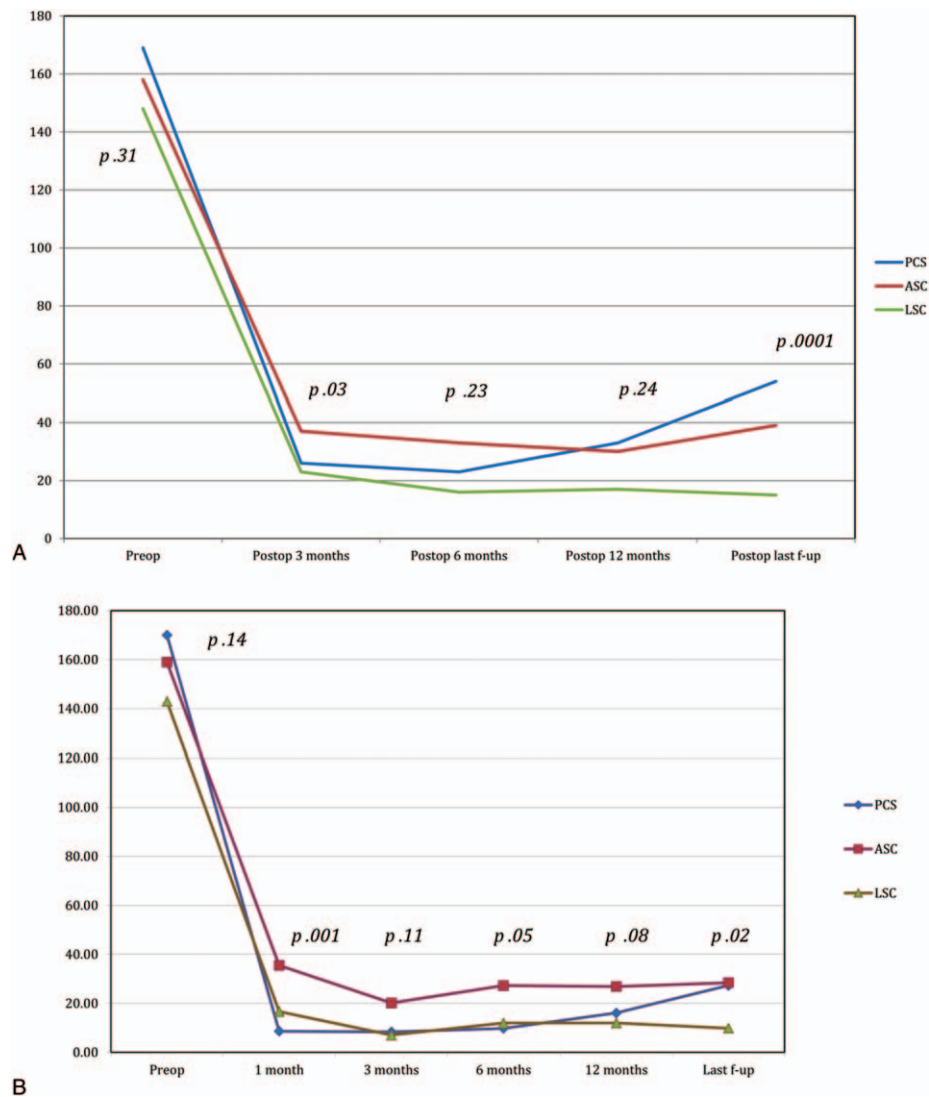
treated by antimuscarinic or beta-agonist drugs. As for concomitant SUI, all patients who have undergone PCS were cured; of the 3 patients with concomitant SUI who have undergone SC because of concomitant posterior compartment POP, 1 was cured by ASC, 1 obtained symptoms reduction after LSC allowing successful treatment by pelvic floor exercises, and 1 had persistent SUI after ASC requiring surgery. De novo SUI occurred in 7.4% of patients who have undergone ASC and 4.7% of patients who have undergone LSC. All of them were mild, with 24-hours pad test showing <20 g/day,<sup>[11]</sup> accordingly, they were successfully treated by pelvic floor exercises.

#### 4. Comment

The present study showed that PCS, ASC, and LSC provided similar results in terms of anatomical correction of POP. In line



**Figure 2.** Kaplan–Meier estimates of POP recurrence of all patients in time (months). (A) Comparison of PCS (S), ASC (A), and LSC (L) (*P* = .87); (B) comparison of PCS and SC (*P* = .84). ASC=abdominal sacrocolpopexy, LSC=laparoscopic sacrocolpopexy, PCS=pubovaginal cystocele sling, POP=pelvic organ prolapsed, SC=sacrocolpopexy.



**Figure 3.** Subjective outcome as assessed by the PFIQ-7 score. (A) All patients; (B) patients without POP recurrence (ANOVA test). ANOVA = analysis of variance, PFIQ-7 = Pelvic Floor Impact Questionnaire (short form), POP = pelvic organ prolapse.

**Table 2**  
Impact of procedures on recurrent UTIs, UUI, and SUI rates (chi-square test).

	PCS	ASC	LSC	P
Recurrent UTI rate				
Preop	18.6%	31%	23.8%	.63
Postop	2.6%	3.7%	0	.69
P	.03	.02	.03	
Concomitant UUI rate				
Preop	23.2%	17.2%	42.8%	.29
Postop	2.6%	0	9.5%	.50
P	.04	.03	.05	
De novo UUI rate	7.8%	7.4%	9.5%	.96
Concomitant SUI rate				
Preop	58.1%	6.9%	4.7%	.0002
Postop	0	3.7%	4.7%	.44
P	.00001	.61	1	
De novo SUI rate	0	7.4%	4.7%	.28

ASC = abdominal sacrocolpopexy, LSC = laparoscopic sacrocolpopexy, PCS = pubovaginal cystocele sling, SUI = stress urinary incontinence, UTI = urinary tract infection, UUI = urge urinary incontinence with detrusor overactivity.

with anatomical findings, the PFIQ-7 showed that PCS, ASC, and LSC provided similar results in terms of symptoms improvement/patient satisfaction; LSC however performed better than ASC and PCS at last-follow-up, probably due to the minimally invasive nature of this procedure.

A relevant part of symptoms improvement/patient satisfaction is linked to curing recurrent UTIs (getting a better and complete bladder voiding) as well as concomitant SUI or UUI rather than causing them.<sup>[12]</sup> Noteworthy, recurrent UTIs ceased in 86.4% (19/22) of the cases, and concomitant UUI ceased in 75% (18/24) of the cases, with no difference among the 3 procedures. Although there was no case of de novo recurrent UTI, short-lasting de novo UUI occurred in 8.6% of patients; again, there was no difference among the 3 procedures and all patients were successfully treated pharmacologically. To date, there seems to be no data that correlate POP symptoms, POP degree, or any urodynamic test parameter to the occurrence or resolution of overactive bladder symptoms. A recent review pointed out that 50% to 90% of patients with concomitant overactive bladder symptoms and POP showed improvement in their symptoms after POP repair with no impact of type of surgery, suture versus

mesh use, or other surgical factors on the degree of improvement.<sup>[13]</sup> Our findings confirm such data.

If concomitant UUI can be usually solved by preoperative drugs and/or POP repair itself and de novo UUI can successfully be treated pharmacologically and modifying personal risk factors, SUI is far more challenging. ASC is associated with a 20% risk of de novo SUI, which rises up to 80% in patients with occult SUI.<sup>[14]</sup> The need for a simultaneous continence procedure during SC is debated. Two recent systematic review and meta-analysis of randomized trials concluded that combined surgery reduces the risk of postoperative SUI,<sup>[3,14]</sup> but short-term voiding difficulties and adverse events are more frequent after combination surgery, particularly with a mid-urethral sling.<sup>[14]</sup>

The present study showed PCS to be the safest procedure for patients with anterior and/or apical compartment POP, as it always corrected concomitant SUI and never caused de novo SUI. The availability of the PCS for patients with concomitant SUI allowed us to schedule for SC only patients without concomitant SUI, unless posterior compartment repair was deemed necessary. By doing so and by routine use of preoperative urodynamic testing to rule out occult SUI, only 1 of the 3 patients with concomitant SUI required transobturator tape repair after SC. Most importantly, de novo SUI occurred only in 7.4% of patients who have undergone ASC and 4.8% of patients who have undergone LSC, a much lower rate than that reported in literature.<sup>[15]</sup>

As for the surgical procedures, the PCS required a significantly shorter surgical time than ASC and LSC, whereas there was no significant difference in postoperative pain and hospital stay between the 3 procedures. The most important difference was in complications. The PCS was associated with a significant higher rate of Clavien 1 complications basically due to the phenomenon of transient urinary retention. There was no difference in Clavien 2 complications, which always consisted in blood transfusion (PCS 2.4% vs SC 4%;  $P=.5$ ); however, 1 patient developed pulmonary embolism after ASC requiring prolonged hospitalization. The most relevant, though not statistically significant, difference was seen in Clavien IIIB complications, as they occurred in 4 patients (3 mesh exposures and 1 ileorrhaphy) in the SC group as opposed to none in the PCS group. The 10% mesh exposure rate seen with ASC was expected as it compares with that reported in literature.<sup>[16]</sup> Interestingly and differently from previous reports,<sup>[16]</sup> we had no case of mesh exposure following LSC. It could be speculated that this finding could have been related to the fact that in most LSC cases we used only 1 anterior mesh and probably less tension. A long surgical time with LSC and even the minimal ileal lesion were somehow expected, considering they were our “learning curve” with all kind of laparoscopic procedures. Other expected findings were less postoperative pain and blood loss for LSC as compared to ASC, as well as equivalence of the 2 procedures in terms of anatomical POP correction.

This study is not without limitations. First, it is a retrospective analysis of prospectively collected data, with patients who have been allocated to different surgical procedures on the basis of clinical judgment rather than randomization. Nevertheless, such allocation criteria and the fact that results were evaluated by a 3rd part make the study a reliable picture of real-life clinical

practice. Another potential limitation is not only used the Pelvic Organ Prolapse Quantification system (POP-Q) that certainly is more accurate than the HWS but also more complex and not worldwide accepted/routinely adopted; anyway in our study vaginal profile was evaluated always by the same experienced urologist. Finally, the use of specific validated questionnaires for incontinence, voiding dysfunction, and sexual function, as well as a cost analysis would have provided further strength to our study.

## 5. Conclusions

This is the first study comparing the PCS with SC, either abdominal or laparoscopic, in real-life surgical management of POP with and without urinary incontinence. Overall, the 3 techniques had similar subjective and objective efficacy, but the PCS can also correct concomitant SUI without causing de novo SUI and proved to be safer than SC, as it was associated with a higher rate of minor complications but a lower rate of complications requiring further surgical treatment.

## Acknowledgments

The authors thank Prof Gopal Badlani for critically reviewing this manuscript.

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