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Original Article

The early benefits of Laparoscopic Sacrocolpopexy

Nikolaos V. Apostolopoulos[a,*,1], Krystallenia I. Alexandraki[b,2], Anwen Gorry[a], Adeyemi Coker[a]

[a] Department of Obstetrics and Gynaecology, Queen's Hospital, Rom Valley Way, Romford, RM70AG, UK
[b] Department of Endocrinology, St Bartholomew's Hospital, West Smithfield, London, EC1A 7BE, UK

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ABSTRACT

Background: Prospective evaluation of the 6 months functional and clinical outcome of 27 patients treated with Laparoscopic Sacrocolpopexy (LSC).
Methods: Pelvic organ prolapse was assessed by Baden-Walker system along with a validated quality of life questionnaire preoperatively and at 6 months postoperatively to assess vaginal, urinary, bowel and sexual symptoms.
Results: At a mean 6 months follow-up, 96% of the symptomatic women had successful vaginal vault support with no recurrence of prolapse symptoms. Successful anatomical outcome (any prolapse ≤ stage 1) was found in 89%. Regarding the urinary functional symptoms, significant improvement was reported in the voiding function, painful symptoms and the relevant quality of life. Stress urinary incontinence resolved in 67% without concomitant continence surgery; 4% from the stress incontinence was *de novo*. Bowel symptoms were common, both pre- and postoperatively; 40% from the postoperative bowel symptoms was *de novo*. Sexually active women reported significant improvement in sexual function; there was one case of *de novo* dyspareunia.
Conclusion: LSC is an effective treatment for vault prolapse as soon as in the 6-months follow-up. The outcome for anterior and posterior support is less predictable. The pelvic organ vaginal, urinary and sexual functional symptoms improve. The effects on bowel function are less clear. Long-term prospective studies are required to establish the duration of the benefits.

Introduction

Pelvic organ prolapse (POP) is estimated to affect 50% of all parous women [1] with a lifetime risk of 30–50% [1]. As Western countries experience a significant increase in their ageing population, POP is expected to become more frequent, implying a growing need for high quality, cost-effective treatment of POP [2]. On the other hand, several studies have shown a link between the number of vaginal deliveries and the risk of POP; the decreasing parity and the increasing rate of caesarean section is anticipated to counter balance the risk of POP in the general population [3,4].

Laparoscopic Sacrocolpopexy (LSC) has evolved from the classical abdominal sacrocolpopexy and is gaining popularity for the treatment of POP. Evidence regarding LSC has increased rapidly with more than 1000 cases reported [5]. However, the main bulk of evidence consists predominantly of retrospective studies evaluating the postoperative anatomical results and symptoms in a non-standardized and non-validated way. The different studies use variations in surgical techniques, disagree in the definition of success and are not controlled for significant co-factors, i.e. concomitant surgical procedures.

Sacrocolpopexy is the preferred procedure for apical vaginal prolapse (Grade A recommendation) and laparoscopy seems to be the preferred approach to Sacrocolpopexy (Grade B recommendation) [6].

Limited data on the functional outcome of LSC are available. A study of 22 women after LSC with a mean follow-up of 27.5 months reported satisfactory anatomical outcome and improvement in the average scores of all the assessed parameters using 2 validated relevant questionnaires [Pelvic Floor Distress Inventory (PFDI) and Pelvic Floor Impact Questionnaire (PFIQ)] [7]. A retrospective study evaluated the outcome of LSC, focusing on vaginal symptoms and sexual function, reporting 88% success rate for the anatomical outcome and 86% satisfactory functional outcome [8]. However, 81% of the women had concomitant surgical procedures which may have influenced the pelvic organ function.

* Corresponding author.
E-mail address: napostol@doctors.org.uk (N.V. Apostolopoulos).
[1] Present address: Iaso Maternity Hospital, Athens, Greece.
[2] Present address: Endocrine Unit, 1st Department of Propaedeutic Medicine, Laiko University Hospital, Medical School, National and Kapodistrian University of Athens, Athens, Greece.

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Randomized controlled studies have supported the value of the LSC comparing to Total Vaginal Mesh placement and Robotic Sacrocolpopexy [9,10].

A recent randomized controlled trial, SALTO-2, compared the LSC or vaginal sacrospinous fixation in patients with a stage ≥2 vault prolapse, underlining the absence of data for quality of life (QoL), which is the most relevant outcome to evaluate the effect of prolapse surgery [11]. The value of using QoL questionnaires in the assessment of women undergoing LSC has been supported in a prospective study of 48 women with advanced stages of POP treated by LSC [12].

The objective of our study was the assessment of the short-term outcome of LSC. The degree and the impact of vaginal, urinary, bowel and sexual symptoms has been assessed using a validated, POP specific questionnaire prior to and 6 months after the operation along with the evaluation of pelvic organ support, using clinical examination.

Patients and methods

This prospective study took place in a tertiary university hospital in north-east London, Queen's Hospital, Barking, Havering & Redbridge Hospitals NHS Trust, where a specialized unit is providing a referral urogynaecology service. All patients with a clinical diagnosis of symptomatic post-hysterectomy vaginal vault prolapse who elected for surgical treatment by LSC were asked to participate in the study. All recruited cases were performed within a period of 24 months. Inclusion and exclusion criteria are presented in Table 1 and the flowchart of patients' participation in Fig. 1. The research was conducted according to the principles as have set by the Helsinki Declaration of 1975 and was authorised by the Research and Development Department of Queen's University Hospital, Barking, Havering & Redbridge Hospitals NHS Trust as a service evaluation project (reference number 180210). Individual permission to use the data was requested from patients who completed the questionnaire.

The preoperative assessment involved a detailed urogynaecological history to explore the presence and significance of any symptoms including the more specific vaginal, urinary, bowel or sexual symptoms. All women had physical examination to determine the presence of prolapse and urinary stress incontinence (SUI) using the Bonney's manoeuvre; the degree of POP was graded per the Baden-Walker halfway vaginal profile [13]. All patients had a mid-stream urine sample sent for culture and sensitivity to exclude the possibility of a urinary tract infection (UTI). If the history was suggestive of SUI and this was confirmed by the clinical examination findings, then multichannel urodynamic studies were carried out to confirm urodynamic SUI. Having consented to have the operation, all eligible women were asked to participate in the study by answering a validated urogynaecological

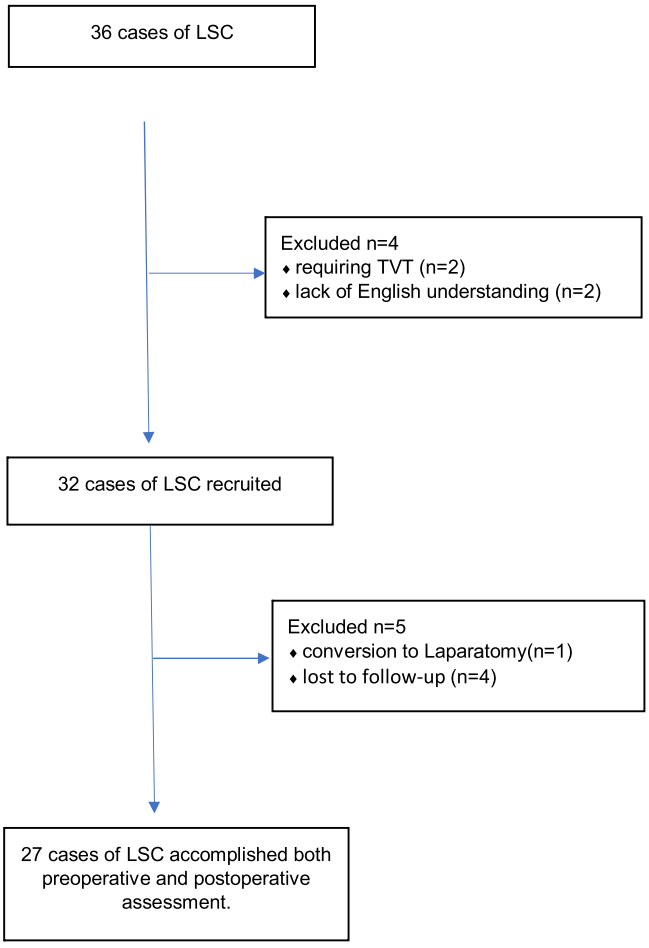

Fig. 1. Flowchart illustrating the patients' recruitment to the study. LSC: Laparoscopic sacrocolpopexy; TVT: Tension Free Vaginal Tape.

Table 1
The inclusion and exclusion criteria of the study. LSC: Laparoscopic sacrocolpopexy.

Inclusion Criteria
1)Women with stage 3 or 4 vaginal vault prolapse.
2)Surgery for vaginal prolapse was planned.
3)Vaginal bulge symptoms were present as indicated by the patient's history.
4)Previous total hysterectomy (abdominal, vaginal or laparoscopic).
5)Women were able and willing to complete the questionnaire and the data collection proforma preoperatively and at 6 months follow-up.
6)Women having concomitant procedures such as anterior and posterior colporrhaphies were included, and the procedures were recorded; they were performed at the discretion of the surgeon after the vault suspension, in such a way that the anterior and posterior vaginal walls after the repair are located at least at the vaginal halfway above the hymen. They should be performed with 1-0 monofilament delayed absorbable sutures.

Exclusion Criteria
1)Any contraindication to LSC in the opinion of the treating surgeon.
2) History of previous surgery that included a vaginal vault suspension technique.
3)Diagnosis of urine stress incontinence as indicated by patient's history and confirmed from the results of urodynamics investigations.
4)Need for concomitant stress incontinence procedure.
5) History of previous synthetic sling procedure for stress incontinence.
6)Use of mesh or biologic graft materials for the anterior or posterior colporrhaphies.
7)History of previous use of mesh or biologic graft materials for anterior or posterior colporrhaphy.
8)Previous adverse reaction to synthetic mesh.
9)Urethral diverticulum, current or previous (i.e. repaired).
10)Non-english speaking patients

QoL questionnaire, the paper version of the electronic pelvic floor assessment questionnaire (ePAQ-PF) to assess their vaginal, urinary, bowel and sexual function [14]. On discharge, the patients were given a follow-up appointment to be reviewed 6 months postoperatively, by clinical examination for POP and answering the ePAQ-PF questionnaire.

Definition of success

The surgery was successful when prolapse at any anatomic site of the vagina was graded as 0 or 1 per the Baden-Walker system, i.e. "no vaginal descent beyond the half-way point of the vagina", at the 6 months follow-up, no re-treatment (any reoperation or use of pessary) for POP was needed over the 6 months follow-up, there was improvement or absence of prolapse related vaginal, urinary, bowel and sexual symptoms, as indicated by the patients' response at 6 months follow-up to the questionnaire.

Statistical methods

Since there were no data available to calculate the sample size, data obtained from the first 5 patients undergoing the surgery was used. As the primary indication for the laparoscopic sacrocolpopexy is the vaginal vault prolapse and the primary aim of the operation is the alleviation of the prolapse symptoms, empirically the difference in the relevant pre and postoperative prolapse symptoms was used to estimate the necessary sample size to detect statistically significant difference ($p \leq 0.05$). Clinical significant improvement was considered the absence of prolapse symptoms postoperatively. The power of the study was set to 90%. The same method was followed to calculate the required sample size to detect a clinically significant difference for the sexual function, as not all women were sexually active preoperatively. Calculations were based in the formula: N = (1.28 + 1.96) ^2*SD^2/(AVERAGE^2). Based on that, 10 patients would be adequate to detect significant improvement in the vaginal pain and, similarly, 11 cases would be adequate to detect improvement in sexual function. From initial 5 recruited women, only 3 were sexually active, implying that a population of at least 11 sexually active women was needed to give adequate power to detect significant changes in the sexual function.

The statistical analysis was carried out using SPSS (version 16.01; SPSS, Inc., Chicago, IL, USA) for Windows XP (Microsoft Corp.). All statistical tests were performed at the significance level of 5% ($P \leq 0.05$). The distribution of normality of continuous variables was assessed by the non-parametric Kolmogorov-Smirnov test. Mean value ± standard deviation (±SD) was reported in normally distributed continuous variables, while the median value and the inter-quartile range (IQR) were used in continuous variables not normally distributed.

Paired-samples *t*-test was used to compare the normally distributed continuous variables. The Wilcoxon two-related-samples test was respectively used to compare the not normally distributed continuous variable.

Results

During the study period, 36 cases of LSC were performed; 32 cases were recruited to participate in the study (2 were excluded as a concomitant Tension-free Vaginal Tape (TVT) was performed and another 2 due to lack of good understanding of English). Five more cases were excluded: 4 women did not attend the postoperative assessment and 1 was converted to open sacrocolpopexy (Fig. 1). Consequently, we have analysed the remaining 27 women (aged: 62.2 ± 8.3 years, BMI: 26.5 ± 3.3 kg/m^2), the median value of parity was 2 (1); none reported caesarean sections in her obstetric history and all had a previous hysterectomy. Nineteen women (70.3%) had a pelvic floor repair including a vaginal hysterectomy (2–15 years before) for POP. Eight women (29.7%) had a total abdominal hysterectomy in the past (7–10 years) for menstrual irregularities (4 had some pelvic floor repair 2–5 years after the hysterectomy).

Operative details (Table 2)

After completion of necessary adhesiolysis, the vesico-uterine peritoneum was reflected anteriorly and the recto-vaginal peritoneum posteriorly reaching the level of the levator ani muscles, to allow enough space at the apex and the posterior wall (about 4–5 cm) for the attachment of the mesh. Next the posterior parietal peritoneum at the level of sacral promontory was incised to expose the anterior sacral fascia. The retroperitoneal tissue was dissected away and the incision was extended all the way to the vagina up to the ventrolateral aspect of the levator ani muscle along the right pelvic sidewall. A single piece of macro porous multifilament polypropylene mesh Gynemesh® (Johnson&Johnson) 25 × 2.5 cm was aligned to cover the full length of the posterior vaginal wall and the apex in the correct anatomical position without tension. Caudally the mesh was sutured to the level of the perineal body close to the levator ani muscle and proximally to the apex of the vagina using 4–5 sutures with 2-0 non-dissolvable polyester 2.0 sutures (Ethibond, Ethicon Inc., Somerville, NJ, US). The cranial aspect of the mesh was stapled to the sacral promontory with two 5-mm tacks (ProTack; Tyco Healthcare, Norwalk, CT, USA), placed over the presacral ligament. The extra length of mesh was trimmed and the peritoneum was sutured over to achieve complete peritonealisation using interrupted absorbable material Vicryl 2/0 (Ethicon, Inc., Somerville, NJ, USA). In two women, an extra posterior colporrhaphy was performed (cases 2, 7). Case 8 was converted to laparotomy due to bowel adhesions involving the vaginal vault and over the sacral promontory (excluded from the study analysis); case 5 had herniation of the small bowel through the 10 mm suprapubic port. The herniation became obvious the first postoperative day. She required laparotomy and small bowel resection with uncomplicated recovery. Case 2 sustained an injury of the right inferior epigastric artery with the trocard and the artery was ligated laparoscopically. Case 11 developed the second postoperative day paralytic ileus because of bowel adhesions requiring extended adhesiolysis. She was managed conservatively; the ileus was resolved spontaneously the fourth postoperatively day. Finally, no complications related to the use of mesh were identified.

Anatomical evaluation

Clinical examination findings in the pre- and postoperatively assessment is presented in Table 2. Prolapse was significantly reduced for all three compartments of the vagina. However, 3/27 women had postoperatively prolapse stage >1: two stage 2 prolapse of the anterior wall; one stage 2 prolapse of the vault. The anatomical (objective) success rate of the operation was 88.8% with recurrence rate of prolapse in 12% of the cases.

Functional evaluation

Patients reporting prolapsed-related functional symptoms are presented in Table 3 along with the alteration shift of the reported functional symptoms from the pre- to the postoperative period and the *de novo* symptoms. Two women reported *de novo* SUI and two *de novo* overactive bladder (OAB) symptoms. All four had urodynamic investigations and urodynamic SUI was diagnosed in one of them and Detrusor Overactivity in another. The first was

Table 2
Operative details of 27 women undergoing laparoscopic sacrocolpopexy and prolapse stages in preoperative and postoperative assessment. B-W: Baden-Walker.

Operative details						
Operative time (minutes) *			103.6 ± 24			
Hospital stay (hours) *			49.8 ± 22			
Estimated blood loss (ml) **			100 (130)			
PROLAPSE (B-W)						
Number of patients	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	P
Anterior wall prolapse	0	12	11	4	0	<**0.001**
Preoperative	11	14	2	0	0	
Postoperative						
Posterior wall prolapse	0	17	5	5	0	<**0.001**
Preoperative	12	15	0	0	0	
Postoperative						
Vaginal vault prolapse	0	0	0	17	10	<**0.001**
Preoperative	18	8	1	0	0	
Postoperative						
Maximal prolapse	0	0	0	17	10	<**0.001**
Preoperative	7	17	3	0	0	
Postoperative						

treated successfully with TVT and the second with pelvic floor exercises. The other two women were treated successfully with pelvic muscle retraining.

The impact score of functional symptoms the pre- and postoperative period is presented in Table 4. Regarding the urinary function, women reported significant improvement of the voiding difficulties ($p = 0.003$), painful symptoms ($p = 0.02$) and the relevant QoL ($p = 0.01$). The vaginal function (prolapse, pain) and the associated QoL improved significantly ($p < 0.001$). Regarding the sexual domain, prolapse related bladder ($p = 0.008$) and vaginal symptoms ($p < 0.001$) had a significantly less severe impact score on the women' sexual function; the relevant QoL improved ($p = 0.004$). Bowel function impact scores remained unchanged. Further analysis of the 24 women with postoperative successful anatomical outcome (any prolapse < stage 2) showed an additional significant improvement of OAB symptoms (preoperative 23.3 ± 13.7 versus postoperative impact score 16.7 ± 12.5, $p = 0.01$).

Discussion

Based on preoperative criteria, the objective success rate of the LSC was 88.8%, in agreement with two retrospective case-series reporting rates 75% and 83%, respectively [15,16]. The National Institute of Health recommended that only the complete absence of prolapse should be considered "normal" (stage 0) [17]. In the present study, the three women with anatomical failed outcome, in the preoperative assessment, had stage 4 vaginal vault prolapse and in the 6 months follow-up they all had satisfactory postoperatively functional outcome. This finding is in agreement with the suggestion that the objective outcome, as assessed by the POP anatomical evaluation, does not always follow the subjective outcome assessed by the women' satisfaction [5]. The clinical importance of stage 2 prolapse that is asymptomatic is also unclear.

The predominant preoperative symptoms reported were vaginal: pain, prolapse and associated reduction in QoL in agreement with other studies [7,18] emphasising that prolapse is the primary reason for LSC. Despite this, the data analysis did not demonstrate any significant correlation between the stage of the prolapse and the degree of symptoms. However, all women had severe prolapse (stage 3 or 4). As early as in 6 months follow-up 94.4%–100% of the symptomatic women reported significant improvement, suggesting LSC is highly effective in alleviating the symptoms and improving the QoL.

In the preoperative responses, sexual symptoms in the sexually active patients were significant and bothersome, underlining the importance of assessing sexual function in women undergoing treatment for prolapse. The significant improvement of these domains postoperatively, was accompanied by improvement in sexual QoL and sexual function. One non-responding patient stated that her family status (widowed) was the reason for her abstinence. Evidence from studies with longer follow-up suggests that sexual activity changes, with women reporting different answers to the relevant questions in each visit [7]. The improvement in sexual function was strongly associated with improvement in the related bladder and vaginal symptoms. In contrast, in another series three women with complete resolution of prolapse symptoms postoperatively had no improvement in sexual function [8], implying the complexity of sexual function.

De novo dyspareunia was reported by one patient (11.1%), in agreement as a previous rate of 8% after validated evaluation [8]. Of note, studies evaluating sexual function in a non-validated way reported improvement of postoperative sexual function with postoperative dyspareunia between 1% and 44% [7,18].

Bowel function in POP is complex and multifactorial [19,20]. Evidence from non-randomized control trials involving the repair of the prolapse of the posterior vaginal compartment suggests that the procedure improves the structural problem but that outcome

Table 3
The number of patients reporting prolapse related functional symptoms along with the alteration shift of the reported functional symptoms from the pre- to the postoperative period and the *de novo* symptoms. Preop: preoperative; Postop: postoperative; QoL: quality of life.

Function	Domain	Preop Symptoms present (N,%)	Postop Symptoms better (N,%)	Postop Symptoms deterioration (N,%)	Postop Symptoms de novo (N,%)	Percentage of improvement (%)
URINARY	Pain	15 (55.6)	12 (44.4)	4 (14.8)	2 (7.4)	85.7
	Voiding	24 (88.9)	17 (63)	3 (11.1)	0 (0)	70.6
	Overactive Bladder	24 (88.9)	16 (59.3)	5 (18.5)	2 (7.4)	66.6
	Stress Urinary Incontinence	17 (63)	11 (40.7)	6 (22.2)	2 (7.4)	64.7
	Impact of urine symptoms on QoL	14 (51.9)	10 (37)	3 (14.3)	2 (7.4)	71.4
BOWEL	Irritable Bowel Syndrome	23 (85.2)	8 (29.6)	7 (25.9)	3 (11.1)	34.7
	Constipation	11 (40.7)	6 (22.2)	4 (14.8)	4 (14.8)	54.5
	Evacuation	21 (77.8)	10 (37)	10 (37)	3 (11.1)	47.6
	Continence	25 (96)	6 (22.2)	6 (22.2)	1 (3.7)	24
	Impact of bowel symptoms on QoL	10 (37)	3 (11.1)	6 (22.2)	2 (7.4)	30
VAGINAL	Pain/Sensation	24 (88.9)	23 (85.2)	0 (0)	0 (0)	95.8
	Prolapse	27 (100)	27 (100)	0 (0)	0 (0)	100
	Impact of vaginal symptoms on QoL	22 (81.5)	22 (81.5)	0 (0)	0 (0)	100
SEXUAL	Impact of bladder symptoms on Sex	12 (80)	7 (53.8)	1 (7.7)	0 (0)	58.3
Preop = 15	Impact of bowel symptoms on Sex	4 (26.4)	1 (7.7)	0 (0)	0 (0)	25
Postop = 13	Impact of vaginal symptoms on Sex	14 (93.3)	11 (84.6)	1 (7.7)	1 (7.7)	78.5
	Impact of sexual symptoms on QoL	13 (86.7)	9 (69.2)	1 (7.7)	1 (3.7)	69.2

Table 4
The change of the impact score of the functional symptoms from the pre- to the postoperative period.

Function	Domain	Preop Impact score	Postop Impact score	p
Urinary	Voiding*	24.4 ± 21.4	12.3 ± 12.7	**0.003**
	Overactive Bladder*	22.5 ± 13.6	17.3 ± 12.9	0.07
	Stress Urinary Incontinence**	6.7 (20)	6.7 (26.7)	0.43
	Pain**	8.33 (16.7)	0 (8.3)	**0.02**
	Impact of urine symptoms on QoL**	11.11(33.33)	0 (11.11)	**0.01**
Bowel	Irritable Bowel Syndrome*	26.5 ± 19.2	26.2 ± 15.1	0.9
	Evacuation *	17.6 ± 15.3	17.6 ± 16.7	1
	Continence*	18.2 ± 8.3	16 ± 9.1	0.14
	Constipation**	0 (50)	0 (33.3)	0.8
	Impact of bowel symptoms on QoL**	0 (11.1)	0 (11.1)	0.4
Vaginal	Prolapse**	75 (33.3)	0 (16.7)	<**0.001**
	Pain/Sensation**	33.3 (25)	0 (16.7)	<**0.001**
	Impact of vaginal symptoms on QoL**	55.6 (66.7)	0 (0)	<**0.001**
Sexual	Impact of bladder symptoms on Sex*	37.2 ± 29.4	14.1 ± 20.2	**0.008**
N = 15 preop	Impact of vaginal symptoms on Sex*	55 ± 27.4	11.5 ± 12.5	<**0.001**
N = 13 postop	Impact of bowel symptoms on Sex**	0 (25)	0 (12.5)	0.3
	Impact of sexual symptoms on QoL*	52.2 ± 30.8	23.1 ± 16	**0.004**

* Variables are given as mean values ± SD.
** Variable is given as median value, inter-quartile range; QoL: quality of life.

on bowel symptoms is unpredictable [21]. In the current study, there was no significant deterioration in the reported impact of symptoms, but 40.7% of the women had *de novo* bowel symptoms. Most of previous reports are restricted by retrospective non-validated evaluation and concomitant additional pelvic floor repair procedures. In a case series of 100 women with 8-year follow-up, *de novo* constipation has been reported to affect up to 56% of women [22]. After a validated evaluation of the bowel function in 22 women undergoing LSC, one third of the women who complained of bowel symptoms postoperatively had no bowel symptoms before surgery [7], and symptoms of transient constipation resolved by 6 months, while preoperative bowel symptoms improved at a 2-year follow-up. In the present study, this finding, in 6-month follow-up was not confirmed. A possible reason for this is the shorter follow-up (6 months compared to 24 months) that did not allow adequate time for the symptoms to resolve. Another possible explanation could be attributed to the high number of women with preoperative bowel symptoms (96%) compared to 61.9% that North et al evaluated. The reason behind the new onset of the bowel symptoms is difficult to analyse [23]. Possible explanation could involve rectal denervation problems from the rectovaginal space dissection and the interference of the mesh with the bowel function. Although evidence suggests that bowel defecation problems are usually transient and in the long-term resolve, women should be made aware of this possibility. Overall, the study suggests that impact of bowel dysfunction does not deteriorate postoperatively and should not be considered as a contraindication for the operation.

Regarding urinary function, in a cohort of 51 women that had LSC significant improvement in SUI, voiding difficulties and improvement of urinary urgency after 5-year follow-up was reported. However, it is not possible to evaluate the real impact of LSC on urinary function as 55% of the women had a paravaginal repair and 91% a concomitant Burch colposuspension [24]. A retrospective analysis of 102 women- with concomitant colpo-suspension in almost 40% reported that urinary symptoms improved in 30% and worsened in 15%, with the remainder being unchanged [25]. A prospective observational study including validated assessment of 22 women (one with concomitant TVT) reported significant improvement of urinary distress symptoms and of urinary related QoL. *De novo* SUI was reported in 13.63% and *de novo* OAB by another 13.63% of women [7].

In the present study, significant improvement was reported for the urinary painful symptoms, the voiding difficulties and for the respective QoL scores. It appears that the restoration of the evaginated bladder has a direct effect on the pain and the voiding difficulties that women with POP complain of and an indirect effect by reducing the risk of recurrent UTI. Regarding the SUI, it improved in 67.4% of symptomatic women without concomitant continence surgery but without reaching statistical significance, implying that urinary dysfunction may improve spontaneously following LSC as assumed to be related to a degree of 'relaxation' of anterior compartment support [7]. One woman developed postoperatively *de novo* urodynamics SUI and required TVT and another one symptom of OAB with the diagnosis of detrusor overactivity. The risk of SUI following prolapse corrective surgery ranges from 8 to 60% [26]. The possibility of unmasking urodynamic SUI because of pulling the vaginal vault posteriorly by the promontoro-fixation has been suggested [27]. A retrospective case-notes review suggested that the risk of developing *de novo* SUI after LSC is 13% [28], in agreement with other case series reporting 10%–15% [7,29] while in the present study was even lower at 3.7%. The suggestion of a simultaneous anti-incontinence procedure along with sacrocolpopexy [26] to prevent an uncommon problem is therefore questionable.

The most interesting finding of the 24 women with successful anatomical outcome is the significant improvement in urinary functional symptoms and particularly of the OAB symptoms, in agreement with a recent retrospective study [30]. Optimal repair of POP with LSC is of benefit for urinary symptoms. It could be speculated that the optimal positioning of the bladder on the anterior vaginal wall with the improvement of the voiding function has a beneficial role in reduction of any residual urine volume, leading to less OAB symptoms. One of the advantages of the current study consists of the homogenous group of the recruited women that had the same treatment-protocol without major concomitant surgical procedures, showing the real impact of the LSC, along with the validated assessment of all the POP functional symptoms. Based on the current evidence, this study is the first that assesses holistically all the relevant symptoms in a validated prospective way.

As the specific study focused on the 6-month outcome, the long-term benefits of LSC in the restricted cohort of 27 patients are not addressed. Additionally, the Baden-Walker score system was used to evaluate the POP instead of the preferentially used nowadays POP-Q system. Although attempted, it was not deemed possible to convert the collected data as in POP-Q system.

Conclusions

The beneficial outcome of LSC on anatomical and functional symptoms, for the treatment of the vaginal prolapse, is evident as early as at 6 months follow-up particularly for urinary function. Valid, reliable, responsive, easily interpreted and clinically relevant assessment tools are necessary to compare treatments and results and, perhaps most importantly, to counsel our patients realistically using outcomes that are relevant to the individual.

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