




# The Effect of Transvaginal Prolapse Surgery on Anorectal Function

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## Abstract

**Objective** Pelvic floor dysfunction can manifest as a spectrum including anorectal dysfunction, vaginal prolapse, and urinary incontinence. Sacrospinous fixation is a procedure performed by gynecologists to treat vaginal prolapse. The present study aims to evaluate the impact of transvaginal prolapse surgery on anorectal function.

**Materials and Methods** We conducted a retrospective review of patients undergoing sacrospinous fixation surgery for vaginal prolapse between 2014 to 2020. Those with anorectal dysfunction who had also been evaluated by the colorectal service preoperatively and postoperatively were included for analysis. These patients were assessed with symptom-specific validated questionnaires. The effect of surgery on constipation and fecal incontinence symptoms was analyzed.

**Results** A total of 22 patients were included for analysis. All patients underwent transvaginal sacrospinous fixation, and 95.4% also had posterior colporrhaphy for vaginal prolapse. There were a statistically significant improvements in the Fecal Incontinence Severity Index (FISI), the St. Mark's Incontinence Score (Vaizey), the embarrassment and lifestyle components of the Fecal Incontinence Quality of Life Score, the Constipation Scoring System, the Obstructed Defecation Score, and components of the Patient Assessment of Constipation Quality of Life score.

**Conclusion** Transvaginal prolapse surgery leads to a favorable effect on anorectal function, with improvements in both obstructed defecation and fecal incontinence scores in this small series.

## Keywords

- ▶ obstructed defecation
- ▶ fecal incontinence
- ▶ transvaginal prolapse surgery
- ▶ pelvic floor
- ▶ sacrospinous fixation

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## Introduction

Pelvic floor disorders encompass a range of conditions including pelvic organ prolapse, urinary incontinence, and anorectal dysfunction. The global burden of these conditions is huge, with the prevalence reported to be as high as 46%.<sup>1</sup> However, only 10% to 20% of those affected by prolapse will seek medical advice.<sup>2</sup> The symptoms are significant, impacting quality of life, body image, relationships, and sexual function.<sup>1</sup> Approximately 20% of women will undergo surgery for prolapse or urinary incontinence by age 80,<sup>3</sup> with the total number of women requiring this surgery anticipated to increase substantially by the year 2050.<sup>4</sup> Most of these women have constipation symptoms, and 31% suffer from fecal incontinence.<sup>5</sup> A mixed picture of constipation and fecal incontinence is common,<sup>6</sup> with the quality of life of those with mixed symptoms worse than that of those with either symptom alone.<sup>7</sup>

Pelvic floor disorders have traditionally been compartmentalized anatomically and functionally into three groups, with the management fragmented between the specialties of gynecology, urology and colorectal surgery. This remains the case in many Australian institutions. More recently, a worldwide interdisciplinary approach has been advocated.<sup>8</sup> There are numerous surgical options available for the treatment of anorectal dysfunction, although there is controversy as to which surgical procedure is most beneficial.<sup>9</sup>

Sacrospinous fixation (SSF) is a transvaginal gynecological procedure in which non-absorbable or absorbable sutures are used to fixate the vaginal vault or uterus to the sacrospinous ligament.<sup>10</sup> The use of SSF in Australia for uterovaginal prolapse or posthysterectomy vaginal vault prolapse is increasing, and is the procedure of choice for many clinicians.<sup>11</sup> There is little in the literature specifically examining the effect of transvaginal prolapse surgery on defecatory symptoms, despite their prevalence in women with vaginal prolapse.

It is our observation that many patients undergoing transvaginal prolapse surgery with SSF report improvements in their anorectal symptoms. Therefore, the present study aims to evaluate the effect of transvaginal prolapse surgery on constipation and fecal incontinence using validated, objective, symptom-severity and quality-of-life scores.

## Materials and Methods

### Patients

Ethical approval and research governance clearance were obtained from the Metro South Human Research Ethics Committee (reference number: LNR/2019/QMS/49518).

We conducted a retrospective review of patients who had undergone SSF for vaginal prolapse at our hospital between 2014 to 2020. Of these women, those who had also been referred and evaluated by staff of the colorectal pelvic floor clinic pre- and postoperatively for troublesome anorectal symptoms were able to be included. Each patient completed several validated questionnaires re-

garding their bowel function, in addition to standard history and physical examination at each review. Due to the rigorous nature of these questionnaires, some patients elected not to complete questionnaires regarding symptoms they were not experiencing, and instead focused on completing the questionnaires that related most to their current symptoms and concerns. Of the 22 patients included in the study, 8 completed questionnaires relating to their constipation symptoms, 7, for their incontinence symptoms, and 7, for both. All patients completed the same set of questionnaires pre- and postoperatively. All patients were first offered conservative measures for their anorectal dysfunction, including lifestyle advice, dietary advice, medical treatments for constipation or diarrhea, and pelvic floor physiotherapy before proceeding to surgery. However, the decision for the SSF surgery was made on the basis of gynecological prolapse symptoms, not due to anorectal symptoms.

### Questionnaires

**Patient Assessment of Constipation Quality of Life (PAC-QOL) questionnaire:** consists of 28 questions on constipation severity divided into categories relating to overall dissatisfaction (physical discomfort, psychosocial discomfort, worries/concerns) and overall satisfaction. A score of 120 for dissatisfaction reflects maximal dissatisfaction, while a score of 20 for satisfaction reflects maximal satisfaction.<sup>12</sup>

**Obstructed Defecation Syndrome Score:** consists of 8 questions that reflect the users' current symptoms of obstructed defecation, scored from 0 to 4. A total score of 32 reflects the most severe symptoms.<sup>13</sup>

**Constipation Scoring System:** consists of 8 questions that reflect the user's current symptoms of constipation scored from 0 to 4. A total score of 32 reflects the most severe constipation symptoms.<sup>14</sup>

**Fecal Incontinence Severity Index (FISI):** the user scores their frequency of incontinence for gas, mucus, and liquid and solid stool on a six-item scale.<sup>15</sup> The final result is the sum of all points, and it ranges from 0 to 61, with a higher score representing a higher perceived severity of incontinence.

**Cleveland Clinic Florida Fecal Incontinence Score (CCFIS):** the user scores their frequency of incontinence of solid stool, liquid stool and gas on a five-point scale, and indicates how often they have to wear a pad or alter their lifestyle due to their incontinence. The lower the score out of 20, the better the continence.<sup>16</sup>

**St. Mark's Incontinence Score (Vaizey Score):** consists of seven questions relating to symptoms of incontinence over the past four weeks. Incontinence of solid stool, liquid stool, gas, and requirement to alter lifestyle due to incontinence are scored on a five-point scale. The need to wear a pad or plug, take constipating medications, and inability to defer passing a motion for 15 minutes is also scored. The lower the score out of 24, the better the continence.<sup>17</sup>

**Fecal Incontinence Quality of Life Scale:** consists of 29 questions on fecal incontinence severity divided into

categories relating to lifestyle, coping/behavior, depression/self-perception, and embarrassment. Lower scores reflect a lower functional status of quality of life.<sup>18</sup>

### Procedure

All patients underwent the SSF surgery with simultaneous anterior and/or posterior colporrhaphy and/or vaginal hysterectomy at the surgeon's discretion. All procedures were carried out under general anesthesia with routine surgical safety checklists, and antibiotic and thromboembolic prophylaxis.

The sacrospinous ligament was accessed via the posterior approach during posterior colporrhaphy, and a right sided sacrospinous fixation was performed. When posterior colporrhaphy was not performed, an anterior approach was undertaken. Via the posterior approach, a midline vertical incision was made over the posterior vaginal wall, extending to below the vault. Sharp dissection was undertaken to mobilize the vagina off the underlying tissues. Further lateral blunt dissection was performed at the mid/upper right-hand side of the vagina to the ischial spine. The tissue and rectum over the coccygeus-sacrospinous ligament (CSSL) complex was mobilized medially towards the sacrum. Two polydioxanone sutures were placed medial to the ischial spine and below the upper border of the CSSL complex. A rectal examination was performed after placement of sutures to exclude rectal penetration or injury. The sutures were then attached to the upper posterior vagina. A posterior colporrhaphy was performed, followed by closure of the vaginal epithelium and elevation of the upper vagina by tying the CSSL sutures that were attached to the upper posterior vaginal wall.

### Follow-up and Data Collection

The paper and digital medical records of the patients were accessed, and the demographic data collated included age, height, weight, medical history, surgical history, obstetric history, and smoking status.

The patients were reviewed in the colorectal pelvic floor clinic and completed their preoperative questionnaires a median of 197 days preoperatively (interquartile range [IQR]: 258 days). The time elapsed between the application of the preoperative questionnaires and surgery was due to the nature of the elective surgical bookings process in Queensland, with these patients being booked as a category 3 (non-urgent) procedure. These patients then returned for review and completed their postoperative questionnaires a median of 196 days post-operatively (IQR: 318 days).

### Statistical Analysis

The normality of the data was first assessed with the Shapiro-Wilk test, with parametric data compared pre- and postoperatively using paired two-tailed *t*-tests, and non-parametric data, using the Wilcoxon matched-pairs signed rank test (IBM SPSS Statistics for Windows, IBM Corp., Armonk, NY, United States, version 22.0). Values of  $p < 0.05$  were considered statistically significant.

**Table 1** Baseline characteristics of patients undergoing sacrospinous fixation surgery (n = 22)

Characteristic	Result
<b>Baseline characteristics</b>	
Age (years)	61.5 ± 9.3
Body Mass Index (Kg/m <sup>2</sup> )	31.2 ± 6.3
Pregnancies	3 (2.25)
Vaginal births	3 (2)
Current smoker	5; 22.7%
Diabetes mellitus	2; 9.1%
Underwent pelvic floor physiotherapy	22; 100.0%
Previous hysterectomy	10; 45.5%
Previous transvaginal procedure for vaginal prolapse	8; 36.4%
Previous transabdominal procedure for vaginal prolapse	0; 0%
Previous procedure for rectal prolapse	3; 13.6%
<b>Surgical characteristics</b>	
Sacrospinous fixation and anterior colporrhaphy	1; 4.5%
Sacrospinous fixation and posterior colporrhaphy	5; 22.7%
Sacrospinous fixation and anterior and posterior colporrhaphy	16; 72.7%
Sacrospinous fixation and vaginal hysterectomy +/- colporrhaphy	7; 31.8%

Note: The normally-distributed variables are shown as mean and standard deviation values. The non-parametric variables are shown as median interquartile range values. The proportions are shown as numbers and percentages.

### Results

A total of 22 patients were included in the study, and their characteristics are shown in ► **Table 1**. On average, the patients were postmenopausal (mean age: 61.5 ± 9.3 years), obese (mean body mass index: 31.2 ± 6.3 Kg/m<sup>2</sup>), and had a median of 3 previous pregnancies and 3 vaginal deliveries. Almost half of the patient cohort had undergone a previous hysterectomy, and 36.4% of the group had been submitted to transvaginal surgery for vaginal prolapse. All but one of the patients included in the study underwent SSF with concurrent posterior colporrhaphy.

General improvements in anorectal function following the SSF surgery were demonstrated on all questionnaires (► **Table 2**). Statistically significant improvements were demonstrated in fecal incontinence measures (FISI [ $p = 0.009$ ], Vaizey [ $p = 0.04$ ], and the "embarrassment" [ $p = 0.008$ ] and "lifestyle" [ $p = 0.02$ ] components of the Fecal Incontinence Quality of Life Scale) and obstructed defecation measures (the Constipation Scoring System [ $p = 0.04$ ], Obstructed Defecation Score [ $p = 0.008$ ], the 'satisfaction' component of the

**Table 2** Changes in anorectal function before and after sacrospinous fixation surgery

Questionnaire	Number	Preoperative score	Postoperative score	p-value
PACQOL – physical discomfort	14	8.2 ± 4.7	7.6 ± 4.1	0.7
PACQOL – psychological impact	14	14.5 ± 9.9	12.4 ± 6.6	0.5
PACQOL – worries	14	31.0 ± 17.0	17.7 ± 9.8	0.013
PACQOL – overall dissatisfaction	15	53.1 ± 28.1	37.8 ± 17.2	0.08
PACQOL – overall satisfaction	15	4.9 ± 3.4	13.3 ± 5.1	< 0.0005
Obstructed Defecation Syndrome Score	12	17.0 (8.3)	8.0 (7.0)	0.008
Constipation Scoring System	15	11.0 (6.0)	10.0 (8.0)	0.04
FIQOLS – lifestyle	14	2.3 (2.4)	3.9 (0.5)	0.02
FIQOLS – coping/behavior	14	1.8 (1.6)	3.2 (1.6)	0.1
FIQOLS – depression/self-perception	14	2.7 (1.8)	3.6 (1.4)	0.1
FIQOLS – embarrassment	14	2.3 (0.8)	3.6 (1.3)	0.008
FISI	14	37.0 (28.5)	12 (26.0)	0.009
CCFIS	13	10 (12.5)	5.0 (11.0)	0.1
St. Mark's Incontinence/Vaizey Score	14	12.1 ± 6.0	6.9 ± 6.0	0.04

Abbreviations: PACQOL, Patient Assessment of Constipation Quality of Life questionnaire; FIQOLS, Fecal Incontinence Quality of Life Score; FISI, Fecal Incontinence Severity Index; CCFIS, Cleveland Clinic Florida Fecal Incontinence Score.

Note: The normally-distributed variables are shown as mean standard deviation values. The non-parametric variables are shown as median and interquartile range values.

PACQOL Score [ $p < 0.0005$ ], and the 'worries' component of the PACQOL [ $p = 0.013$ ]. No scores were found to worsen following surgery.

## Discussion

The present study is the first to demonstrate a measurable improvement in both fecal incontinence *and* constipation symptoms in patients undergoing transvaginal surgery with SSF for vaginal prolapse. Using validated scoring systems for anorectal function, a statistically significant improvement was demonstrated in domains of six out of the seven questionnaires used. There was a trend to improvements in all scoring systems, and it is possible that with a larger cohort, statistical significance could have been reached for the remaining scores.

Whilst the respective roles of pelvic floor support structures remain controversial and the consequences of anatomical defects are poorly characterized,<sup>19</sup> prolapse surgery directed at anatomical correction may lead to improved rectal function. Laparoscopic ventral mesh rectopexy, for example, has been shown to improve both fecal incontinence and obstructed defecation,<sup>20</sup> while the novel technique of cardinal and uterosacral ligament reconstruction has been shown to improve fecal and urinary incontinence.<sup>21</sup> The SSF may provide similar benefits due to the fact that it creates a posteriorly directed vector of support, promoting normal rectal function through the restoration of correct anatomical relationships. The effect could also occur through the downgrading of any element of rectal intussusception. The impact of SSF and perineorrhaphy on fecal incontinence symptoms is generally not well documented in the literature. In one small series<sup>22</sup> on 16 patients who underwent surgery, 93.5%

reported improvement in fecal incontinence after surgery over an average of 37 months of follow-up. This group<sup>22</sup> suggested that restoration of the anatomical anorectal angle following SSF, or subtle correction of the rectal prolapse by suspending the vaginal vault higher, could explain its effect on anorectal function. Several other studies have discussed the benefits of transvaginal prolapse surgery on constipation-type symptoms. One study<sup>23</sup> on 72 patients undergoing SSF (with or without colporrhaphy, or transvaginal tape procedure) found significant benefits for constipation and obstructed defecation symptoms, but not for fecal incontinence symptoms. A posthoc analysis<sup>24</sup> of a major clinical trial on prolapse surgery with either SSF or uterosacral ligament fixation (353 patients) reported rates of 36% of "cure", and of 15% of "improvement" in obstructed defecation symptom scores after 2 years of follow-up. However, 13.3% of the patients experienced new obstructed defecation symptoms or worsening symptoms after their surgery.<sup>24</sup> Similarly, a prospective case series on twenty patients undergoing transvaginal SSF demonstrated statistically significant improvements in obstructed defecation symptoms using the Pelvic Floor Disability Index (PFDI-20) questionnaire.<sup>25</sup> Finally, other studies<sup>26</sup> have commented on improvements in general colonic symptomatology after SSF surgery, but have not distinguished between fecal incontinence or obstructed defecation syndrome symptoms. Our results augment these previous reports, showing with validated scores that transvaginal prolapse surgery positively influenced both obstructed defecation and fecal incontinence symptoms in our group. Due to the nature of the surgical treatment for pelvic organ prolapse, the combination of surgeries performed with SSF differs across the literature. Concurrent hysterectomy, anterior or posterior colporrhaphy, or other

surgeries, are commonly performed at the time of SSF. Thus, it is difficult to determine how much each aspect of the performed gynecological surgery played in the improvements observed in the present study and makes comparisons to previous studies challenging.

All but one of our patients underwent a simultaneous transvaginal posterior colporrhaphy. Posterior colporrhaphy is widely accepted as a treatment for rectocele and obstructed defecation,<sup>8</sup> although its impact on fecal incontinence is uncertain. Several studies have presented conflicting results regarding the impact of posterior colporrhaphy on anorectal function. One study,<sup>27</sup> for example found that over half of the patients who undergo posterior colporrhaphy for rectocele experience improvement in symptoms of obstructed defecation. In contrast, a retrospective review<sup>28</sup> of 231 women demonstrated worsening constipation and fecal incontinence following this surgery. A recent systematic review by Grimes et al.<sup>29</sup> (2019) examining surgery in the posterior vaginal compartment demonstrated improvement in anatomy and obstructed defecation symptoms after native-tissue posterior colporrhaphy; however, only two of the included studies used validated questionnaires, and neither reported improvements in fecal incontinence symptoms. These differing findings may relate to patient selection and the heterogeneity of the surgeries performed.

The strengths of the present study include its use of multiple validated, objective, symptom-severity and quality-of-life scores, which have not been previously used in this patient cohort. A comprehensive, specific assessment of the impact of transvaginal prolapse surgery on both fecal incontinence and constipation parameters has not been performed previously. The approach of the present study was multidisciplinary, the topic is clinically relevant, and it addresses an important subject that had not yet been closely assessed. The present study suggests that the benefits of transvaginal prolapse surgery extend above and beyond correction of prolapse, and SSF could be considered a surgical option in patients who complain of both prolapse and anorectal dysfunction. Multidisciplinary pelvic floor units should be aware of the multicompartmental benefits of SSF when selecting patients for surgery. Performing SSF for vaginal prolapse in the first instance may assist in correcting anorectal dysfunction and thereby avert the need for further surgical intervention for defecatory symptoms. However, there are also limitations that should be acknowledged. Firstly, the small sample size precluded a detailed analysis of potentially confounding factors. Of the included patients, 77.2% had a concurrent anterior colporrhaphy, 95.4%, a posterior colporrhaphy, and 31.8%, a hysterectomy at the time of their SSF. It is therefore difficult to conclude what element of the surgery contributed most to the effect on anorectal function, and future larger-scale studies could focus on this, and evaluate whether other forms of vaginal prolapse corrective surgery (such as laparoscopic) also have an effect. Secondly, due to the design of the study only patients who had significant anorectal symptoms in addition to vaginal prolapse (and were evaluated by our colorectal pelvic floor service) could be included. The effect of trans-

vaginal prolapse surgery on anorectal function in other patients undergoing SSF at our hospital was not explored and remains a topic for future research. Thirdly, the follow-up period in the present study was relatively short due to the fact that patients with significant improvement in their symptoms were usually discharged from the service at their follow-up appointment. This could be addressed in future studies designed to follow these women in a longer term for recurrence of their symptoms. Fourthly, the impact of surgery on urological symptoms was not assessed. Finally, the anatomical differences of these patients pre- and postoperatively were not assessed due to the retrospective nature of the study, and because the surgery was for gynecological prolapse correction rather than anorectal symptom treatment.

## Conclusion

In this small cohort of women, transvaginal prolapse surgery with SSF had a positive effect on both constipation and fecal incontinence symptoms. Further larger-scale studies are required.

### Synopsis

Transvaginal prolapse surgery leads to a favorable effect on anorectal function with improvements in both obstructed defecation and fecal incontinence scores.

### Author Contributions

AW and CG were involved in study conceptualization, design, and methodology. RC performed data collection and analysis, and wrote the original draft. All authors were involved in reviewing and editing the final manuscript.

### Conflict of Interests

The authors have no conflict of interests to declare.

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