

Development of abnormal bowel function after simple hysterectomy

P. Phangsuwan¹, P. Suprasert^{1,*}

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Chiang Mai University Chiang Mai 50200 (Thailand)

Summary

Objective: To evaluate patient bowel function following trans-abdominal hysterectomy (TAH). **Materials and Methods:** Patients scheduled for TAH were interviewed using a bowel function questionnaire at day 1 preoperatively and at 1, 3 and 6 months postoperatively. The questionnaire consisted of 18 items pertaining to bowel function, each with 5 score levels (0 to 4). A low score indicated fewer symptoms, with the sum of possible scores ranging from 0-72. **Results:** Seventy-four patients were recruited between March and September 2017. The mean patient age was 51.3 years and the most common diagnosis was myoma (41.9%) followed by endometrial cancer (18.9%), ovarian cancer (12.2%) and ovarian tumor (12.2%). Previous cesarean section was reported in 24.3% of patients, while 30% underwent lysis of adhesions. Gastrointestinal medication and laxatives were given to 70% and 2.7% of patients, respectively. The mean sum of the score for the questionnaire was 1.91, 0.81, 0.54 and 0.46, respectively, for preoperative day one and for 1, 3 and 6 months postoperatively. The mean scores for the 3 post-operative time points were significantly lower than that of the preoperative period. **Conclusion:** Most patients who underwent TAH did not develop abnormal bowel function after surgery. Moreover, patients who initially had bowel dysfunction showed significant improvement post-hysterectomy.

Key words: Bowel function; Simple hysterectomy.

Introduction

Simple hysterectomy is the most common gynecologic procedure for various indications such as myoma uteri, adenomyosis, preinvasive cervical disease and endometrial cancer [1]. Aside from trans-abdominal hysterectomy (TAH), several other routes for hysterectomy have been described including transvaginal, laparoscopic and robotic. However, TAH currently remains the most common route [2]. Hysterectomy is generally associated with minimal postoperative morbidity, with the reported complications being infection, hemorrhage, pelvic pain, thrombosis and injury of nearby organs. The risk factors for developing such complications include elderly age, obesity, previous pelvic surgery, the extent of disease and the level of experience of the surgeon [2, 3]. Of note, the hysterectomy procedure involves a risk of injury to the pelvic autonomous plexus and especially the branches of the inferior hypogastric nerve during cutting of the uterosacral and cardinal ligaments. This step may lead to disturbance of postoperative bowel function [4]. Several earlier studies reported an increase in changes to bowel habits following hysterectomy [4-8]. However, a number of subsequent studies did not observe bowel dysfunction [3, 9, 10]. Due to these controversial results and to the limited data available in Asian populations regarding this possible complication, the authors conducted a prospective trial to evaluate patient bowel function following TAH.

Material and Methods

This prospective study was conducted after approval from the Ethics Committee of the Faculty of Medicine, Chiang Mai University, Thailand. All patients over the age of 20 years who were scheduled for TAH between March and September 2017 were invited to participate in the study. All had to communicate well in the Thai language and be available for interview by the researcher (PP) in regard to bowel function. This was conducted preoperatively on day one, as well as at 1, 3 and 6 months postoperatively using a gastrointestinal quality of life index questionnaire in Thai. Patients who were pregnant, had intraoperative bowel injury, or could not complete the questionnaire at 3 of the 4 time points were excluded from the study.

The gastrointestinal quality of life index questionnaire used in this study was modified from The Gastrointestinal Quality of Life Index (GIQLI) [12]. It evaluates the severity of bowel function using the following 18 items: abdominal pain, epigastric fullness, bloating, flatus, belching, abdominal noises, bowel movement, anorexia, restricted eating, regurgitation, impaired eating speed, dysphagia, bowel urgency, diarrhea, constipation, nausea, blood in stool, and bowel urgency. All items had 5 levels of frequency, with a score of 4 indicating always, 4 indicating almost always, 2 indicating sometimes, 1 indicating not often, and 0 indicating never. The maximum total score was 72 (18 × 4). The questionnaire was validated by a pilot study with the study patients. Patients were interviewed regarding the frequency of the 18 items within the past 2 weeks at day 1 preopera-

Table 1. — Patient Characteristics (N = 74).

	N
Mean Age (year) (SD)	51.34 (8.98)
Mean BMI (kg/m ²) (SD)	24.11 (3.77)
Mean Hospital Stay (Day) (SD)	7.18 (2.38)
Mean Estimated Blood Loss (mL) (SD)	241.62 (209.31)
Mean Operative Time (min) (SD)	146.54 (41.84)
Mean Duration of Antibiotic (Days) (SD)	6.18 (3.57)
Mean Duration of Morphine (Days) (SD)	1.47 (0.579)
Marital Status	
Single	9 (12.2%)
Married	62 (83.3%)
Divorce	2 (2.7%)
Widow	1 (1.4%)
Parity	
Nulliparity	20 (27.0%)
Multiparity	54 (73.0%)
History of Abortion	13 (17.6%)
Previous Cesarean Section	
1 Time	10 (13.5%)
2 Times	8 (10.8%)
Previous Other Surgery	5 (6.8%)
Diagnosis	
Myoma	31 (41.9%)
CA Corpus	14 (18.9%)
CA Ovary	9 (12.2%)
Ovarian Tumor	9 (12.2%)
Adenomyosis	6 (8.1%)
Other *	5 (6.8%)
Uterine Size (Weeks)	
Normal	23 (31.1%)
8-10	16 (21.6%)
12-14	19 (25.7%)
16-18	10 (13.5%)
> 18-24	6 (8.1%)
Adding Procedure (Beyond Hysterectomy)	
Unilateral Salpingo-Oophorectomy	6 (8.1%)
Bilateral Salpingo-Oophorectomy	51 (68.9%)
Adhesiolysis	22 (29.7%)
Developed Rectovaginal Space	13 (17.6%)
Omentectomy	16 (21.6%)
Lymphadenectomy	16 (21.6%)
Other #	4 (5.4%)
Adhesion in Cul-De Sac	12 (16.2%)
Postoperative Laxative Usage	2 (2.7%)
Postoperative Gastrointestinal Drug Usage	
Omeprazole	15 (20.3%)
Simeticone (Air-X®)	29 (39.2%)
Antiemetic	6 (8.1%)
Hyoscine Butylbromide (Buscopan®)	2 (2.7%)
Perioperative Complication	
None	61 (82.4%)
Fever	9 (12.2%)
Wound Infection	2 (2.7%)
Bowel Ileus	1 (1.4%)
Urinary Tract Infection	1 (1.4%)

*other = cervical dysplasia (2), cervical cancer (2), gestational trophoblastic disease (1).

#Adding procedure: other = upper vaginectomy (1), appendectomy (1), urethral stenting (1), cystoscopy (1).

Table 2. — Summary of Gastrointestinal Quality of Life Index Questionnaire Scores ($N = 74$).

Time	Mean	SD	Median	Range	95% CI	<i>p</i> Value*
Preoperative	1.91	4.224	0	0-25	0.93-2.88	-
1 Months	0.81	1.44	0	0-6	0.198-1.991	0.017
3 Months	0.54	1.377	0	0-8	0.384-2.346	0.007
6 Months	0.46	1.218	0	0-8	0.452-2.440	0.005

SD = standard deviation, CI = confidential interval. *Paired *t* test: compared to preoperative period.

tively. They were then interviewed at 1, 3 and 6 months postoperatively by the same researcher via telephone. The mean total score of each postoperative item was compared to the preoperative score using the paired *t* test. A *p*-value of < 0.05 was considered statistically significant.

A sample size of 42 patients was required to achieve 90% power to detect a difference of 10 points in the total score between different times. Because some patients were likely to be lost to follow-up, 90 patients were recruited to the trial.

Clinical characteristics recorded for each patient included age, indication for TAH and final diagnosis. Statistical analysis was performed using SPSS version 21.0. Descriptive data were presented as the mean \pm SD or median, as appropriate. The paired *t* test was used to compare the mean postoperative total bowel function score with the preoperative time, as described above.

Results

A total of 151 patients were scheduled for TAH during the study period. Sixty patients declined to participate, with the most common reason being the inability to complete every time-point for the questionnaire. Therefore, 91 patients gave written informed consent. However, the operation was cancelled for one patient, thus leaving 90 patients who completed the pre-operative questionnaire. Of these, 7 were later excluded due to cancelled hysterectomy, 1 underwent subtotal hysterectomy and 5 developed bowel injury. Eighty-three patients completed the questionnaire at 1 month postoperatively. At 3 months postoperatively, 8 patients could not be contacted and 1 patient developed cancer of the caecum. A total of 74 patients therefore completed the questionnaire at 3 and 6 months postoperatively, as shown in Figure 1.

The mean age of the 74 patients who completed every time-point of the questionnaire was 51.5 years (range 31-76 years). Most patients were married and multiparous. About 20% of patients had undergone a cesarean section and 6.8% had experienced another surgery. The most common indication was myoma followed by endometrial cancer, ovarian cancer, ovarian tumor and adenomyosis. Uterine size in 20% of the patients was larger than 14-week size. Most of the additional surgical procedures other than TAH were bilateral salpingo-oophorectomy (BSO). One-third of patients underwent adhesiolysis and 21% underwent lymphadenectomy. The rectovaginal space was developed in 17% of patients during the hysterectomy procedure. Adhesions in the cul-de-sac were found in 16% of patients. A

small number of patients used laxative and gastro-intestinal drugs postoperatively. The majority of patients did not develop postoperative complications. Details of the clinical data are shown in Table 1.

Most patients showed a low GIQLI score during the preoperative phase, with a mean of 0.91, median of zero and range of 0-25. Only two patients revealed high scores of 22 and 25. Both were diagnosed with ovarian cancer and their scores decreased to 6, 0, 0 and 3, 3, 2, respectively, at 1, 3 and 6 months postoperatively.

Table 2 summarizes the results of GIQLI scores at each time-point. These showed a significant decrease in the sum of the scores at 1, 3 and 6 six months postoperatively when compared to the preoperative period. The highest score recorded was 8, implying that minimal bowel dysfunction occurred following TAH and almost no patients developed bowel dysfunction.

Discussion

The development of bowel dysfunction following TAH has been reported in previous studies [4-8]. Hoboken *et al.* [12] proposed a possible mechanism involving neural damage after the surgical intervention and mechanical changes in the spatial relationship of the pelvic organs due to removal of the uterus. Another hypothesis proposed by Sperber *et al.* [10] involves brain-gut dysregulation and postulates that inflammation following gynecologic surgery injures the abdomino-pelvic afferent nerves and causes irritable bowel syndrome. However, the present study did not find severe bowel dysfunction following TAH, with almost all patients showed significantly lower GIQLI scores compared to the preoperative period. These findings corroborate those of other prospective studies that did not find any bowel dysfunction after hysterectomy [3, 9, 10]. Lashen *et al.* [3] recently conducted a prospective observational study on 85 patients who underwent TAH for a benign condition. They used a GIQLI that included 36 questions on bowel, social and sexual functions. The evaluations were conducted at 2 weeks before surgery and then at 6, 12, 24 and 52 weeks after surgery. These workers also found that patient quality of life improved after surgery. Sperber *et al.* [9] performed a prospective, controlled study to compare the occurrence of constipation in 58 TAH patients with 123 matched, non-surgery controls at enrollment and at 3 and 12 months after surgery. These authors reported no differences between the two groups at both follow-up time-points in terms of functional constipation, frequency of stools, stool consis-

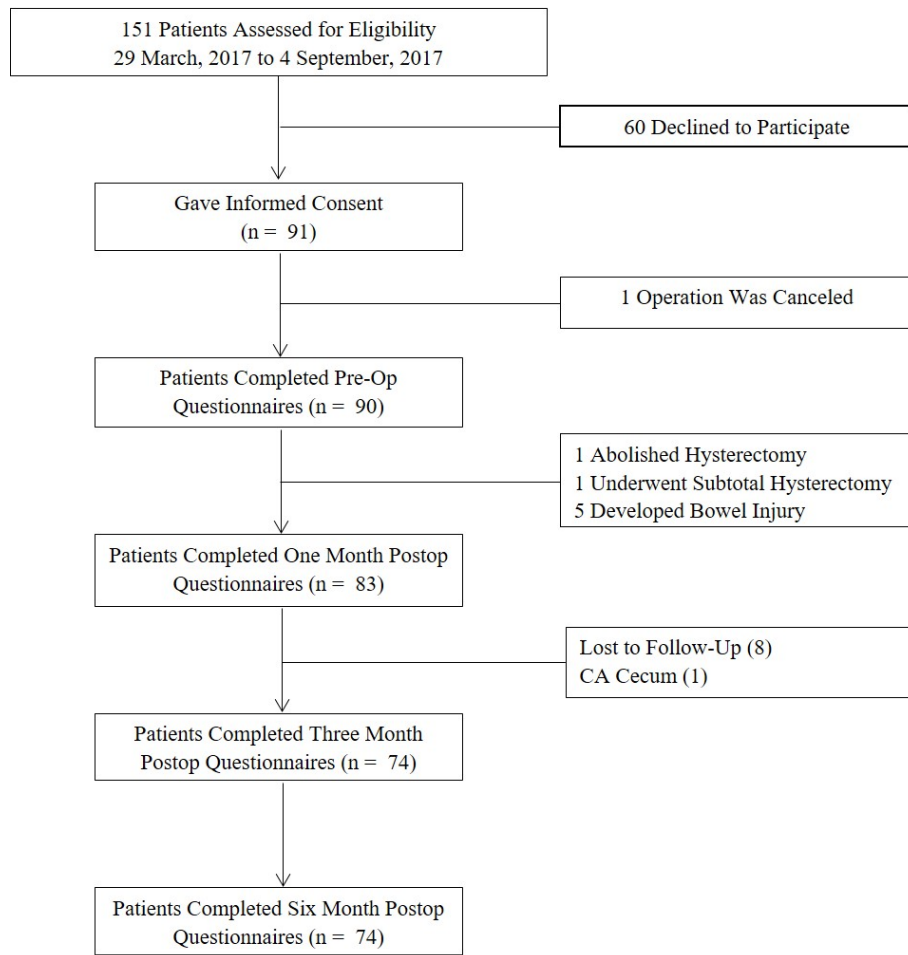


Figure 1. — Consort of Participants.

tency, straining, feeling of obstruction or need to manually evacuate stool. The present study also did not find any increase in constipation after hysterectomy. From these results, the hypothesis regarding possible nerve damage and inflammation affecting bowel function does not appear to be supported.

The strength of this study was that all benign and malignancy patients who underwent a simple hysterectomy were included. Although one-third of patients had a malignancy and 25% of patients had multiple previous operations, their bowel function did not worsen, with the maximum preoperative score below 10 points. Furthermore, all participants were questioned by one interviewer, thereby eliminating interpersonal bias. However, a possible limitation of the study was that the original international GIQLI proposed by Eypasch *et al.* [11] was not used. Instead, a modified version of this questionnaire was used to allow ease of communication with the study patients.

Conclusions

Simple TAH for benign and malignant conditions did not affect bowel function in this cohort of patients.

Ethics Approval and Consent to Participate

All subjects gave their informed consent for inclusion before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of the Faculty of Medicine, Chiang Mai University, Thailand (approval number: 005/2017).

Acknowledgments

We wish to thank the National Research University Project under Thailand's Office of Higher Education Commission and Chiang Mai University for the financial support in this project.

Conflict of Interest

The authors declare no conflict of interest.

Submitted: July 24, 2019

Accepted: October 30, 2019

Published: October 15, 2020

References

- [1] Carlson K.J., Nichols D.H., Schiff I.: "Indications for hysterectomy". *N. Engl. J. Med.*, 1993, 328, 856.
- [2] Clarke-Pearson D.L., Geller E.J.: "Complications of hysterectomy". *Obstet. Gynecol.*, 2013, 121, 654.
- [3] Lashen H., Jones G.L., Duru C., Pitsillides C., Radley S., Jacques R.M., *et al.*: "Bowel dysfunction after total abdominal hysterectomy for benign conditions: a prospective longitudinal study". *Eur. J. Gastroenterol. Hepatol.*, 2013, 25, 1217.
- [4] Altman D., Zetterström J., López A., Pollack J., Nordenstam J., Mellgren A.: "Effect of hysterectomy on bowel function". *Dis. Colon Rectum.*, 2004, 47, 502.
- [5] Taylor T., Smith A.N., Fulton M.: "Effects of hysterectomy on bowel and bladder function". *Int. J. Colorectal Dis.*, 1990, 5, 228.
- [6] Smith A.N., Varma J.S., Binnie N.R., Papachrysostomou M.: "Disordered colorectal motility in intractable constipation following hysterectomy". *Br. J. Surg.*, 1990, 77, 1361.
- [7] Heaton K.W., Parker D., Cripps H.: "Bowel function and irritable bowel symptoms after hysterectomy and cholecystectomy – a population based study". *Gut*, 1993, 34, 1108.
- [8] Roovers J.P., van der Bom J.G., Huub van der Vaart C., Fousert D.M., Heintz A.P.: "Does mode of hysterectomy influence micturition and defecation?" *Acta Obstet. Gynecol. Scand.*, 2001, 80, 945.
- [9] Sperber A.D., Morris C.B., Greenberg L., Bangdiwala S.I., Goldstein D., Sheiner E., *et al.*: "Constipation does not develop following elective hysterectomy: a prospective, controlled study". *Neurogastroenterol. Motil.*, 2009, 21, 18.
- [10] Sperber A.D., Morris C.B., Greenberg L., Bangdiwala S.I., Goldstein D., Sheiner E., *et al.*: "Development of abdominal pain and IBS following gynecological surgery: a prospective, controlled study". *Gastroenterology*, 2008, 134, 75.
- [11] Eypasch E., Williams J.I., Wood-Dauphinee S., Ure B.M., Schülling C., Neugebauer E., *et al.*: "Gastrointestinal Quality of Life Index: development, validation and application of a new instrument". *Br. J. Surg.*, 1995, 82, 216.
- [12] van Hoboken E.A., Timmermans F.G., van der Veek P.P., Weyenberg P.T., Masclee A.A.: "Colorectal motor and sensory function after hysterectomy". *Int. J. Colorectal Dis.*, 2014, 29, 505.

Corresponding Author:

PRAPAPORN SUPRASERT, M.D.

Division of Gynecologic Oncology, Department of Obstetrics and Gynecology, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200 (Thailand)

e-mail: psuprase@gmail.com;

prapaporn.su@cmu.ac.th