

# Hysterectomy Does Not Cause Constipation

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## ORIGINAL CONTRIBUTION

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**PURPOSE:** This study was designed to evaluate the risk on development and persistence of constipation after hysterectomy.

**METHODS:** We conducted a prospective, observational, multicenter study with three-year follow-up in 13 teaching and nonteaching hospitals in the Netherlands. A total of 413 females who underwent hysterectomy for benign disease other than symptomatic uterine prolapse were included. All patients underwent vaginal hysterectomy, subtotal abdominal hysterectomy, or total abdominal hysterectomy. A validated disease-specific quality-of-life questionnaire was completed before and three years after surgery to assess the presence of constipation.

**RESULTS:** Of the 413 included patients, 344 (83 percent) responded at three-year follow-up. Constipation had developed in 7 of 309 patients (2 percent) without constipation before surgery and persisted in 16 of 35 patients (46 percent) with constipation before surgery. Preservation of the cervix seemed to be associated with an increased risk of the development of constipation (relative risk, 6.6; 95 percent confidence interval, 1.3–33.3;  $P=0.02$ ). Statistically significant risk factors for the persistence of constipation could not be identified.

**CONCLUSIONS:** Hysterectomy does not seem to cause constipation. In nearly half of the patients reporting constipation before hysterectomy, this symptom will disappear.

**KEY WORDS:** Hysterectomy; Constipation; Defecation; Prognostic factor; Prospective study.

Hysterectomy is the most performed gynecologic operation. This procedure has been proven to be

safe and highly effective.<sup>1,2</sup> However, because the majority of hysterectomies are performed to improve the patient's quality of life rather than to cure life-threatening conditions, associated morbidity is poorly tolerated by both the patient and the doctor. Hysterectomy disrupts the pelvic anatomy and the local nerve supply in the pelvic. Therefore, it is conceivable that hysterectomy induces micturition and defecation symptoms.<sup>3–7</sup>

Several authors have addressed the effect of hysterectomy on the occurrence of constipation.<sup>5–7</sup> However, the theory of damage to the pelvic plexus that innervates the left colon and the rectum was refuted by Prior and coauthors<sup>8</sup> who found after hysterectomy evidence of increased rectal sensitivity, which, by definition, is the reverse of autonomic denervation. Because most of the studies relating constipation to hysterectomy have a retrospective design, it is not clear whether hysterectomy truly induces constipation or whether constipation was already present before the hysterectomy. Furthermore, little is known about potential risk factors for the development of constipation after hysterectomy. The lack of data on this subject bothers the gynecologist with the difficult task to inform the patient about her individual risk to develop constipation after hysterectomy.

We present the data of a prospective, multicenter study performed to evaluate the long-term effects of hysterectomy on constipation and to identify predictors of constipation after hysterectomy.

## PATIENTS AND METHODS

The design of the study has been described previously.<sup>9</sup> In short, a prospective, observational study was performed among females undergoing hysterectomy for benign disease in 13 teaching and nonteaching hospitals in the Netherlands. The study was approved by all local ethical committees, and written informed consent was obtained from all patients. We recruited consecutive females who had been offered hysterectomy between January 1999 and July 2000. Exclusion criteria were known endometriosis and symptomatic descensus of the uterus as indication for hysterectomy.

Before hysterectomy, the gynecologist who had set the indication completed a standardized form to score age,

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obstetric history, history of abdominal surgery, indication for hysterectomy, duration of complaints, postmenopausal status, maximal diameter of the uterus as assessed by ultrasound, indication for vaginal or abdominal hysterectomy, and indication for removal or preservation of the cervix. After surgery, the gynecologist who had performed the hysterectomy completed a standardized form to score the following variables: duration of surgery in minutes, amount of blood loss in ml, and complications during surgery. At the day of discharge, this form was completed by documenting the duration of hospital stay and complications during hospital stay.

All patients completed before, and at three years after, surgery the Defecation Distress Inventory (DDI).<sup>10</sup> The DDI is a Dutch validated questionnaire that was developed identical to the Urogenital Distress Inventory<sup>11,12</sup> by our research group and is used to assess the presence and experienced discomfort of defecation symptoms. The 15 questions were developed after studying the literature and international definitions, interviewing patients who presented with constipation or fecal incontinence, and by interviewing three experts in the field from the Department of Surgery and Department of Obstetrics and Gynecology from the University Medical Centre Utrecht, The Netherlands. Eventually, a structured interview of the 15 selected items was held with 20 female patients. For this study, we used the response to two questions of the DDI: "Do you have less than three bowel movements per week?" and the question: "Do you have to strain > 25 percent of the time to have a bowel movement?" According to the definition of Drosman *et al.*, constipation was considered to be present if the patient responded positive to both of these questions.<sup>13</sup>

**Table 1. Patient characteristics (n=334)**

Age (yr)	44	(6)
Parous (n)	281	(84)
Body mass index (kg/m <sup>2</sup> )	25	(4)
History of abdominal surgery (n)	126	(38)
Comorbidity (n)	235	(70)
Duration of symptoms (mo)	34	(32)
Indication for hysterectomy (n) <sup>*</sup>		
Menorrhagia	231	(69)
Metrorrhagia	104	(31)
Abdominal pain	144	(43)
Dysmenorroe	76	(23)
Fibroma present on ultrasound (n)	228	(68)
Maximal diameter of uterus (cm)	10.3	(3.5)
Descensus of uterus (cm) <sup>†</sup>	-5.4	(2.9)

Values are means with standard deviations in parentheses or numbers with percentages in parentheses. • Not mutually exclusive. • <sup>†</sup>Measured under anesthesia by pulling down the cervix with a forceps.

**Table 2. Surgical procedures and complications**

No. of patients	334	
Surgical procedures		
Total abdominal hysterectomy	158	(47)
Subtotal abdominal hysterectomy	91	(27)
Vaginal hysterectomy	85	(25)
Surgery time (min)	62	(20)
Blood loss (ml)	275	(210)
Complications during surgery	18	(5)
Bleeding requiring transfusion	14	(4)
Bleeding requiring reoperation	2	(1)
Bladder lesion	2	(1)
Complications during hospital admission	14	(4)
Vault abscess	2	(1)
Vault hematoma	1	(0)
Cystitis	3	(1)
Bladder retention	4	(1)
Fever of unknown origin	2	(1)
Pulmonary embolism	2	(1)

Values are means with standard deviations in parentheses or numbers with percentages in parentheses. • Some patients had more than one complication.

### Statistical Analysis

This statistical analysis was designed to calculate the risk of constipation after hysterectomy and to identify which patient characteristics are prognostic factors for the development or persistence of constipation. The prevalence of constipation that persisted or had developed after hysterectomy was compared for the presence or absence of different patient characteristics and tested for statistical significance by using Fisher's exact test. The risk of constipation after hysterectomy was expressed by the relative risk (RR) and 95 percent confidence interval (CI). The RR expresses the risk of a patient in whom a condition is present compared with a patient in whom this condition is not present. Variables that were tested for their statistical significance were age, body mass index, parity, history of abdominal surgery, presence of comorbidity, indication for hysterectomy, presence of fibroma, maximal diameter of the uterus, vaginal or abdominal approach, and removal of the cervix.  $P < 0.05$  was considered to be statistically significant. The statistical package SPSS® 11.5 was used to perform our analysis (SPSS, Inc., Chicago, IL).

### RESULTS

Of the 413 included patients, 344 (83 percent) responded at three-year follow-up. Characteristics of responders and nonresponders were similar. Patient characteristics of the responders can be found in Table 1. The performed surgical procedures and complications are shown in Table 2. One of four hysterectomies was performed vaginally. If abdominal hysterectomy was performed, the cervix was preserved in one of three patients. The complication rate during surgery was 5 percent and during admission 4 percent.

### **De Novo Constipation after Hysterectomy**

At three years after surgery, constipation had developed in 7 of 309 patients (2 percent) without constipation before surgery. Table 3 shows the risk on development of constipation according to the different patient characteristics and surgical parameters. It seemed that preservation of the cervix was associated with a higher risk to develop constipation after hysterectomy. We reviewed the medical files of the seven patients who developed constipation and found that in three of these patients total hysterectomy was planned; however, during surgery because of difficult surgical conditions, such as adhesions and/or fibroma extending into the cervix, it was decided to preserve the cervix. All patients who developed constipation had undergone abdominal hysterectomy, had fibroma on ultrasound, had not undergone previous abdominal surgery, and did not have metrorrhagia as indication for hysterectomy.

### **Persistence of Constipation**

Constipation persisted in 16 of 35 patients (46 percent) with constipation before surgery. Table 3 shows the risk on persistence of constipation according to the different patient characteristics and surgical parameters. Persistence of constipation seemed not to be related to any of these variables.

## **DISCUSSION**

The purpose of our study was to investigate whether hysterectomy causes constipation and to identify prognostic factors for the development or persistence of constipation. Two percent of the patients developed constipation. Preservation of the cervix seemed to be associated with an increased occurrence of constipation, but the small numbers make the relevance of this finding questionable. In nearly half of the patients reporting constipation before hysterectomy, this symptom had disappeared at three years after surgery.

The present study was based on a multicenter cohort study of 413 females undergoing vaginal, subtotal abdominal, or total abdominal hysterectomy. Data were prospectively collected, potential confounders were accurately documented, and a validated questionnaire was used to assess the occurrence of constipation. Some limitations need to be discussed. First, the number of patients in the stratum with constipation present before surgery was relatively small. Therefore, it was difficult to study predictors of persistence of constipation. Second, the number of patients that developed constipation was so low that it is questionable whether one should attempt to identify risk factors for this occurrence. One of the strengths of our study is that we managed to assess complete follow-up of more than 80 percent of our cohort at three years after surgery.

There is a widespread but poorly quantified belief that hysterectomy is associated with bowel problems, especially

constipation. This belief has been based on retrospective studies relating bowel dysfunction to hysterectomy. Taylor and coauthors<sup>6</sup> compared females with bowel symptoms after hysterectomy with age-matched healthy control subjects. Posthysterectomy females reported more commonly infrequent bowel movement, use of laxatives, and consulted more often a doctor because of constipation. Van Dam *et al.*<sup>7</sup> compared bowel function in 593 females who had undergone hysterectomy to a control group consisting of 100 women who had undergone laparoscopic cholecystectomy and found that bowel dysfunction was significantly more common after hysterectomy. Heaton and coauthors<sup>5</sup> also observed that constipation was more common after hysterectomy than after laparoscopic cholecystectomy. Because of the retrospective design of these studies, it seems reasonable to assume that the operation precedes the onset of bowel dysfunction. Furthermore, retrospective studies may be biased by recall bias, in specific, patients may have forgotten the exact timing of the onset of constipation.

Similar to our findings, one other study prospectively evaluating the effects of hysterectomy on constipation did not observe an increased incidence of constipation postoperatively.<sup>14</sup> In a randomized trial comparing the effects of total and subtotal abdominal hysterectomy on pelvic floor function, the prevalence of constipation after surgery was lower than before surgery. The authors did not present the data stratified for presence or absence of constipation before hysterectomy.

The reported prevalence of constipation in the community ranges from 2 to 28 percent and depends on the used definition.<sup>15</sup> The definition for constipation we use has been described by Drossman *et al.*<sup>13</sup> and includes both frequency of defecation and “the necessity to strain.” In most studies, constipation is defined as a bowel frequency of less than three times per week.<sup>15</sup> The use of our stricter definition may explain the low prevalence of constipation both before and after hysterectomy. However, it has been shown that adding “the necessity to strain” to the definition significantly increases the sensitivity of the symptoms to identify individuals with constipation.<sup>16</sup>

Studies initiated to identify prognostic factors for the development or persistence of constipation have, as far as known, not been published. In this study, the small number of patients that developed constipation (7/309) and the small number with constipation before surgery (35/344) limited the identification of prognostic variables for the development and persistence of constipation. However, it was an interesting observation that preservation of the cervix seemed to be associated with an increased incidence of constipation after hysterectomy. In a randomized trial comparing the effects of total and subtotal abdominal hysterectomy on pelvic floor function, preservation of the cervix and prevalence of constipation after surgery were not related to each other.<sup>17</sup> As mentioned in the results section, review of the medical

**Table 3. Risk of development or persistence of constipation three years after hysterectomy for different patient characteristics and surgical parameters**

Patient characteristic/surgical parameter	Risk of development of constipation					Risk of persistence of constipation					
	n	(%)	RR	95 percent CI	P value <sup>†</sup>	n	(%)	RR	95 percent CI	P value <sup>†</sup>	
Age (yr)	<40	3/70	(4)	2.3	(0.2–21.2)	0.63	5/10	(50)	*	*	1
	40–50	3/179	(2)	0.9	(0.1–8.4)	1	9/21	(43)	*	*	0.45
	>50	1/53	(2)	1			1/1	(100)	1		
Body mass index (kg/m <sup>2</sup> )	<22	0/51	(0)	*	*	0.33	5/10	(50)	0.9	(0.4–2)	0.87
	22–25	2/99	(2)	0.6	(0.1–3)	0.7	1/5	(20)	0.4	(0.1–2.3)	0.32
	>25	5/145	(3)	1			8/15	(53)	1		
Parous	Yes	4/252	(2)	1			14/29	(48)	1		
	No	3/50	(6)	3.8	(0.9–16.4)	0.09	1/3	(33)	0.7	(0.1–3.6)	1
History of abdominal surgery	Yes	0/116	(0)	1			4/10	(40)	1		
	No	7/186	(4)	*	*	0.06	11/22	(50)	1.3	(0.5–3)	0.71
Comorbidity	Yes	3/85	(4)	1			4/11	(36)	1		
	No	4/208	(2)	0.5	(0.1–2.4)	0.42	10/20	(50)	1.4	(0.6–3.4)	0.71
Menorrhagia**	Yes	5/206	(2)	1			10/25	(40)	1		
	No	2/96	(2)	0.9	(0.2–4.3)	1	5/7	(71)	1.8	(0.9–3.5)	0.21
Metrorrhagia**	Yes	0/95	(0)	1			5/9	(56)	1		
	No	7/207	(3)	*	*	0.1	10/23	(44)	0.8	(0.4–1.7)	0.7
Abdominal pain**	Yes	4/133	(3)	1			6/11	(55)	1		
	No	3/169	(2)	0.6	(0.1–2.6)	0.7	9/21	(43)	0.8	(0.4–1.6)	0.71
Dysmenorrhoe**	Yes	1/67	(1)	1			5/9	(56)	1		
	No	6/235	(2)	1.7	(0.2–14)	1	10/23	(44)	0.8	(0.4–1.7)	0.7
Fibroma present on ultrasound	Yes	7/206	(3)	1			7/19	(37)	1		
	No	0/92	(0)	*	*	0.1	8/13	(62)	1.7	(0.8–3.5)	0.28
Maximal diameter of uterus (cm)	<8	0/52	(0)	*	*	0.18	3/6	(50)	1	(0.3–2.8)	1
	8–10	2/142	(1)	0.3	(0.1–1.5)	0.24	7/16	(44)	0.9	(0.4–2)	1
	>10	5/108	(5)	1			5/10	(50)	1		
Surgical approach	Vaginal	0/74	(0)	1			6/11	(55)	1		
	Abdominal	7/228	(3)	*	*	0.2	9/21	(43)	0.8	(0.4–1.6)	0.71
Removal of the cervix	Total	2/219	(1)	1			11/23	(48)	1		
	Subtotal	5/83	(6)	6.6	(1.3–33.3)	0.02	4/9	(44)	0.9	(0.4–2.2)	1

RR = relative risk; CI = confidence interval. \* Cannot be calculated. \*\* Indication for hysterectomy. † Calculated by Fisher's exact test.

files of the seven patients who developed constipation showed that in three of these patients during surgery the cervix could not be removed because of difficult surgical conditions, such as adhesions and/or fibroma extending into the cervix. As a consequence, the prognostic value of the variable “preservation of the cervix” seems to be confounded by the technical difficulty of the procedure. Even while preserving the cervix, it is likely that these surgical procedures have caused more autonomic nerve damage with the development of constipation as a result.

## CONCLUSIONS

In our study, only 2 percent of the patients developed constipation. Because the prevalence of constipation increases with age, the observed development in our study might reflect the natural course of this symptom.<sup>18</sup> Therefore, we conclude that hysterectomy does not affect the occurrence of constipation. Preservation of the cervix was associated with an increased risk on the development of constipation after hysterectomy, but this was largely

explained by more difficult and extensive surgery. If present before hysterectomy, constipation had disappeared at three years after surgery in almost half of the patients.

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## INVITED COMMENTARY

**To the Editor**—Hysterectomy is the most common major gynecologic operation and the procedure usually has a low risk for postoperative morbidity. Sometimes patients report unwanted effects on bowel function after hysterectomy, but there are a limited number of studies<sup>1–8</sup> on this subject and most of them are retrospective in nature. Previous studies also have reported contradictory results.

Roovers *et al.* should be commended for conducting a prospective large-scale study to determine the development of constipation after hysterectomy. The 83 percent response rate after three years is impressive. In a recent prospective study,<sup>9</sup> we found similar results as Roovers *et al.* We evaluated the influence of hysterectomy on bowel function in 120 consecutive patients, and we found a trend toward more anal incontinence symptoms but no deterioration of constipation.

Roovers *et al.* have defined constipation as the presence of less than three bowel movements per week and straining more than 25 percent of the time to have a bowel movement. This definition classifies patients with only one of these symptoms as not constipated.

We do not agree with this restrictive definition of constipation, and there is ample support from our standpoint in the literature. It is correct that Koch *et al.*<sup>10</sup> found that straining is a sensitive criterion for constipation. In their conclusion, however, they recommend physiologic testing in the assessment of constipated patients rather than using the definition used in the present study. The authors reference a study by Drossman *et al.*<sup>11</sup> for their definition of constipation. This study is 15 years old and is primarily focused on describing the range of bowel patterns in the general population and not to define constipation. Dr. Drossman is otherwise one of the authorities behind the Rome criteria for functional bowel disorders, including constipation.<sup>12</sup> In the latest communication from the Rome initiative, constipation is defined as “persistently difficult, infrequent, or seemingly incomplete defecation, which do not meet IBS criteria.”<sup>13</sup> The American College of Gastroenterology states that “constipation is characterized by unsatisfactory defecation that results from infrequent stools, difficult stool passage, or both.”<sup>14</sup>

The restrictive definition of constipation in the present study limits the number of constipated patients, which may have influenced the results and conclusions. It would be interesting to see whether the outcome would change with a more liberal, and more commonly used, definition of constipation.

We are still lacking large prospective studies focused on evaluating the influence of hysterectomy on different aspects of bowel function. This is an important topic for future studies, given the high incidence of this operation in the female population.

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## THE AUTHORS REPLY

**To the Editor**—Colleagues Mellgren and Altman do not agree with the restrictive definition of constipation. In our study, constipation was considered to be present if the patient responded both positive to the questions: “Do you have less than three bowel movements per week?” and “Do you have to strain >25 percent of the time to have a bowel movement?” The DDI questionnaire does not only question whether a symptom is present but also the experienced amount of bother by that symptom.

We reanalyzed our data and found that 2.4 percent of the asymptomatic patients developed infrequent bowel movement, whereas 17.6 percent of the asymptomatic patients developed the need to frequently strain. We also analyzed how bothered the patients were by these symptoms and found that three years after surgery 38 percent of the patients were severely bothered by infrequent bowel movements, whereas only 11 percent of the patients were severely bothered by the need to frequently strain.

We concluded that frequency of bowel movement and the need to strain are represented in the definition of constipation according to the “Rome criteria” and “The American College of Gastroenterology.” Based on our own data, we state that quality of life related to constipation is mainly determined by the frequency of bowel movement. In our study, 2.4 percent of the preoperative asymptomatic patients had developed this symptom at three years after surgery.

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