

Research Article

Postoperative Urinary Retention in Total Vaginal and Abdominal Hysterectomy in Benign Gynecological Disorders

Insidens Retensi Urin Pascahisterektomi Total Pervaginam dan Perabdominam pada Kelainan Ginekologi Jinak

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Abstract

Objective: To assess and compare the incidence of urinary retention in patients post-vaginal and abdominal total hysterectomy for benign gynecological disorders.

Method: This is a comparative analytical study with prospective and retrospective cohort design, which was conducted in Dr. Cipto Mangunkusumo Hospital and Persahabatan Hospital from June 2012 to February 2014.

Result: We recruited thirty-eight research subjects who underwent abdominal hysterectomy, and 18 subjects who underwent vaginal hysterectomy. The majority of cases underwent the procedure for abnormal uterine myoma (55.5%) and adenomyosis (28.9%). Incidence of urinary retention post-hysterectomy was 33.3% for vaginal hysterectomy, and 31.6% for abdominal hysterectomy. The comparison of the incidence of urinary retention showed no difference between vaginal and abdominal hysterectomies (RR=1.056).

Conclusion: Vaginal hysterectomy does not increase the incidence of postoperative urinary retention. However, this study suggests the need for further research with a larger sample size, employing prospective cohort design, with preoperative measurement of post-voiding urine volume (PVR).

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Keywords: abdominal hysterectomy, urinary retention, vaginal hysterectomy

Abstrak

Tujuan: Untuk menilai dan membandingkan insidens retensi urin pada pasien pascahisterektomi total pervaginam, dan perabdominam untuk kelainan jinak ginekologi.

Metode: Penelitian ini adalah penelitian analitik komparatif dengan desain kohort prospektif dan retrospektif yang dilakukan di RS Dr. Cipto Mangunkusumo dan RS Persahabatan pada Juni 2012 - Februari 2014.

Hasil: Didapatkan 38 subjek penelitian yang menjalani histerektomi perabdominam, dan 18 subjek yang menjalani histerektomi pervaginam. Sebagian besar kasus dilakukan histerektomi untuk kelainan mioma uteri (55,5%) dan adenomyosis (28,9%). Didapatkan insidens retensi urin pascahisterektomi sebesar 33,3% untuk histerektomi pervaginam dan 31,6% untuk histerektomi perabdominam. Perbandingan insidens retensi urin antara histerektomi pervaginam dan perabdominam menunjukkan tidak adanya perbedaan di antara kedua kelompok (RR=1,056).

Kesimpulan: Histerektomi pervaginam tidak meningkatkan insidens retensi urin pascaoperasi. Namun penelitian ini menunjukkan perlunya penelitian lebih lanjut dengan jumlah sampel yang lebih besar, menggunakan desain kohort prospektif, dengan pengukuran volume urin pascaberkemih (PVR) preoperatif.

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Kata kunci: histerektomi perabdominam, histerektomi pervaginam, retensi urin

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INTRODUCTION

Hysterectomy is a major surgery mostly performed in the field of gynecology.¹ In general, hysterectomy aims in improving quality of life, with 90% of procedures performed for the indication of benign disorders and functional symptoms, such as pelvic pain (17%), bleeding (42.7%), or both (40.3%).² Hysterectomy can potentially disrupt urinary function, as it causes denervation of the pelvic region. The increasing incidence of postoperative urinary retention is associated with the ex-

pansion of dissection into the parametrium and lateral and posterior pelvic wall. In total hysterectomy, either vaginal or abdominal, parametrial dissection should be performed with caution and should not extend deeper into the cardinal-uterosacral ligament complex. In theory, either vaginal or abdominal total hysterectomy technique should not cause extensive damage to the innervation of the bladder, thus not leading to any significant urinary disorders.^{3,4}

Urinary retention is one of the complications that can occur postoperatively in both obstetric

and gynecologic surgery. Management of postoperative urinary retention is done with continuous bladder catheterization or intermittent catheterization. It brings discomfort for patients, increases the risk of urinary tract infection, prolongs time to normal activity, and lowers patients' satisfaction.^{5,6} In addition, inappropriate management of postoperative urinary retention can lead to overstretching of the bladder, urinary tract infection, and complications associated with catheterization.⁷

According to Cosson⁸, postoperative complications were found to be lower in total hysterectomy through vaginal approach than the abdominal approach ($p < 0.001$). It was in accordance with the results of a Cochrane review⁹ stating vaginal hysterectomy to be better than abdominal hysterectomy. Therefore, whenever possible, vaginal approach is more recommended in total hysterectomy.

Currently, the use of a catheter for 24 hours post-gynecologic surgery without complications is a widely accepted standard procedure. The protocol for postoperative total vaginal hysterectomy applied in the Department of Obstetrics and Gynecology of Dr. Cipto Mangunkusumo Hospital involves removal of the catheter within 24 hours post-surgery with the patient encouraged to urinate spontaneously within 4-6 hours after the catheter is removed. Patient is then re-catheterized to measure the residual urine volume. This protocol is not applied in abdominal hysterectomy, with the assumption that vaginal hysterectomy increases the risk of urinary retention. Furthermore, currently no research has been carried out in Indonesia, comparing the total incidence of urinary retention post-vaginal and abdominal hysterectomy. Therefore, we aim to compare the incidence of urinary retention post-vaginal and abdominal total hysterectomy in benign gynecological disorders.

METHOD

Our study is a combined prospective and retrospective cohort study comparing the incidence of urinary retention in post-vaginal and abdominal total hysterectomy in the case of benign gynecological disorders, in the Department of Obstetrics and Gynecology at Dr. Cipto Mangunkusumo Hospital and Persahabatan Hospital in Jakarta, during the period of June 2012 - February 2014. Inclusion criteria includes women who underwent vaginal or

abdominal total hysterectomy for the indication of benign gynecological disorders, aged ≤ 55 years old, body mass index $< 30 \text{ kg/m}^2$ and willing to participate in the study. Exclusion criteria include women with a previous history of urinary disorders, a history of pelvic surgery, suspected malignancy, endocrine disorders such as diabetes mellitus or hyperthyroidism, history of medications affecting urination, pelvic organ prolapse more than stage 2, and acquired bladder or ureteral injury during hysterectomy.

Sampling was conducted by consecutive sampling, so that all subjects with an indication for total vaginal or abdominal hysterectomy in benign gynecological disorders were recruited until the minimum number of subjects was fulfilled.

The patients who presented to the gynecology clinic with benign gynecological disorders indicating a total hysterectomy and fulfilled the inclusion and exclusion criteria would be given information about the study. Initial plans call for patients to be randomly allocated to either total vaginal or abdominal hysterectomy. However, changes were implemented in the sample collection as no randomized allocation was done and the allocation for total vaginal hysterectomy (TVH) or total abdominal hysterectomy (TAH) was done based on the operator ability and preference, especially in cases of uterine enlargement and attachment of the internal genitalia. Twenty-four hours post-hysterectomy, urinary catheter would be removed, the patient asked to drink to a maximum limit of 100 ml per hour until spontaneous voiding stimuli appears. Residual volume post-voiding was measured by female catheter. Urinary retention is diagnosed when residual urine volume exceeds the limit of 100 ml.

Data analysis was done using the statistical program Stata 10 (Statistical Analysis of Data 10). We performed descriptive analysis with categorical scale for each variable, such as urinary retention, method of hysterectomy, and parity. The results of statistical analysis are presented as incidence/proportion. We also performed relative risk calculation with 95% confidence interval.

RESULTS

The total samples recruited during the period were 56 subjects, which consisted of 38 cases of abdominal hysterectomy and 18 cases of vaginal hysterectomy. Among the 18 patients who underwent vagi-

nal hysterectomy, four patients were identified from medical record search. Data search was done from the medical record using ICD-9 CM code 68.5 for vaginal hysterectomy. We tried to identify cases of vaginal hysterectomy over the last 5 years in Dr. Cipto Mangunkusumo and selected cases based on the inclusion and exclusion criteria.

Based on our research, the option of abdominal approach was more commonly performed than vaginal hysterectomy, and in the majority of cases, the indication for hysterectomy was uterine myoma.

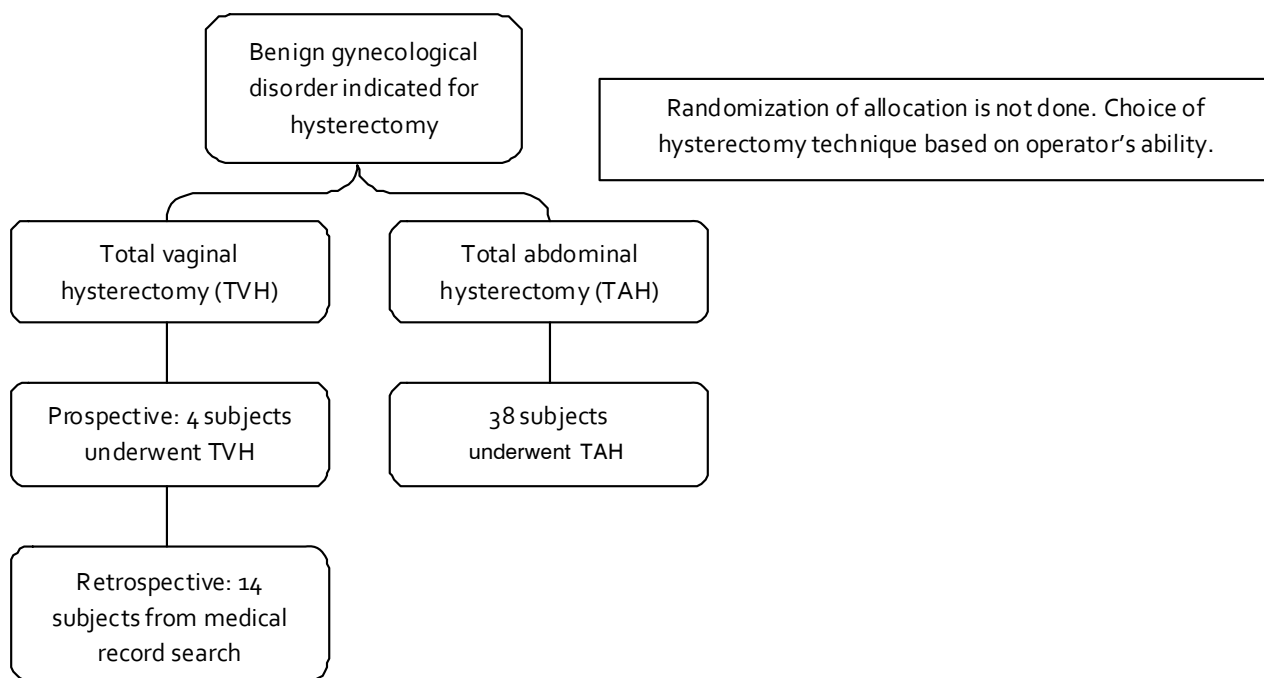


Figure 1. Flow of Patient Recruitment

Table 1. Indication for Hysterectomy Procedure

Indication for hysterectomy	Vaginal hysterectomy (n=18)	Abdominal hysterectomy (n=38)
Uterine myoma	10 (55.5%)	19 (50%)
Adenomyosis	3 (16.7%)	11 (28.9%)
Endometrial hyperplasia	3 (16.7%)	3 (7.9%)
Ovarian cyst	-	5 (13.2%)
Grade-1 uterine prolapse	2 (11.1%)	-

Table 2. Baseline Characteristics of Study Subjects

Characteristic	Total (n = 56)	TVH (n = 18)	TAH (n = 38)	p
Age, mean \pm SD	46.43 \pm 7.014	48.33 \pm 3.956	45.53 \pm 7.958	0.084 ^a
Age group, n (%)				
\leq 40 years old	7 (12.5)	0 (0)	7 (18.4)	
41 - 45 years old	14 (25.0)	3 (16.7)	11 (28.9)	0.200 ^b
46 - 50 years old	19 (33.9)	9 (50.0)	10 (26.3)	
$>$ 50 years old	16 (28.6)	6 (33.3)	10 (26.3)	
Parity, n (%)				
Nullipara	6 (10.7)	1 (5.6)	5 (13.2)	
Primipara	10 (17.9)	2 (11.1)	8 (21.1)	0.846 ^b
Multipara	35 (62.5)	13 (72.2)	22 (57.9)	
Grande multipara	5 (8.9)	2 (11.1)	3 (7.9)	
BMI (kg/m²), Mean \pm SD	23.23 \pm 3.593	23.16 \pm 4.356	23.26 \pm 3.236	0.927 ^a
BMI group, n (%)				
$<$ 18.5 (underweight)	3 (5.4)	0 (0)	3 (7.9)	1.000 ^b
18.5 - 24.9 (normal)	41 (73.2)	14 (77.8)	27 (71.1)	
\geq 25 (overweight)	12 (21.4)	4 (22.2)	8 (21.1)	
Surgery duration (minute), mean \pm SD	155.71 \pm 37.397	175.83 \pm 34.947	146.18 \pm 35.037	0.005 ^a
Blood loss estimation (ml), median (IQR)	200 (100 - 475)	150 (100 - 200)	300 (137.50 - 500)	0.002 ^c

^a Independent sample t-test

^b Kolmogorov-Smirnov

^c Mann-Whitney

The mean age of our subjects was 46.43 \pm 7.014 with no significant difference in both groups (p=0.084). The mean body mass index of our subjects was 23.23 \pm 3.593. Furthermore, body mass index was categorized into underweight (BMI $<$ 18.5 kg/m²) accounting for 5.4%; normal weight (BMI 18.5 to 24.9 kg/m²) accounting for 73.2%; and overweight (BMI \geq 25 kg/m²) accounting for 21.4% of subjects. Analysis of all the variables showed that baseline characteristics of the two groups were similar (p $>$ 0.05), thus we can conclude that both groups were comparable.

Based on Table 3, the incidence of urinary retention post-hysterectomy was 33.3% for total

vaginal hysterectomy and 31.6% for abdominal approach. There was no difference in the incidence of urinary retention between the two groups with p=0.896 with a relative risk (RR) of 1.056. Thus, we can interpret the data to suggest that vaginal approach for total hysterectomy did not increase the risk for urinary retention.

The influence of parity was analyzed using bivariate analysis and no significant difference was found in the occurrence of urinary retention in both groups. The result of body mass index analysis also showed no significant difference in the occurrence of urinary retention in both groups.

Table 3. Comparison of Urinary Retention Incidence Post-Hysterectomy.

Variable	Retention (+)		Retention (-)		p	RR	95% CI
	n	%	n	%			
Hysterectomy							
TVH	6	33.3	12	66.7	0.896 ^a	1.056 ^f	0.473 - 2.358
TAH	12	31.6	26	68.4			
Parity							
Nullipara ^b	1	16.7	5	83.3	0.928 ^a	1.040 ^g	0.443 - 2.441
Primipara ^b	4	40.0	6	60.0			
Multipara ^c	9	25.7	26	74.3			
Grande multipara ^c	4	80.0	1	20.0			
BMI Group							
< 18.5 ^d	1	33.3	2	66.7	0.732 ^h	0.733 ⁱ	0.253 - 2.122
18.5-24.9 ^d	14	34.1	27	65.9			
≥ 25 ^e	3	25.0	9	75.0			

^a Chi-Square^{b-e} Merged for statistical analysis^f TVH/TAH ratio^g Multipara and Grande Multipara per Nullipara and Primipara ratio^h Fischer's Exact testⁱ Ratio of BMI ≥ 25 kg/m² compared to BMI < 25 kg/m²

DISCUSSION

In our study, the abdominal approach is more widely used than the vaginal approach in hysterectomy. This is consistent with the finding of Kovac⁸, that abdominal hysterectomy is performed more often in the United States, although the evidence suggests that vaginal approach is better in terms of fewer complications, better quality-of-life post-surgery, and cheaper costs. Several factors may influence the operators in choosing the abdominal approach: training received during residency, personal experience of the operator, operator capability, the traditional teaching pattern in making medical decisions, and different interpretation of the results.⁸

Subjects generally underwent hysterectomy due to cases of uterine myoma. Our study did not apply any limitations for the uterine size allowed for vaginal hysterectomy. According to studies by ACOG¹⁰ and Kovac¹¹, vaginal hysterectomy is indicated for women with uterine size corresponding

to <12 weeks of gestation (<280 grams). However, from the results of randomization of patients undergoing vaginal and abdominal hysterectomy with uterine enlargement between 200 grams to 1300 grams, vaginal hysterectomy is more advantageous in terms of shorter duration of surgery, febrile morbidity, and the length of treatment.¹⁰ The heaviest uterine size where vaginal hysterectomy was done in this study is 600 grams, and the subject did not experience postoperative urinary retention. This is consistent with findings of Benassi et al¹², who found no difference in intraoperative complications between the vaginal or abdominal hysterectomy group in cases of uterine enlargement.

All of our subjects received regional anesthesia, either spinal or combined spinal and epidural anesthesia. Various studies on the effect of anesthesia on postoperative urinary retention have been carried out. According to Baldini et al¹³, the incidence of postoperative urinary retention in hysterectomy does not differ significantly in patients undergoing

general anesthesia compared to combined regional anesthesia (general and epidural). This was supported by the findings of Tammela¹⁴ and Bodker et al¹⁵, who stated no significant difference in the occurrence of postoperative urinary retention in regards to the type of anesthesia. Based on the results above, we did not perform further analysis on the effect of anesthesia towards postoperative urinary retention.

Analysis of the duration of surgery in both groups showed a significant difference, where vaginal hysterectomy needed a longer time than abdominal hysterectomy ($p=0.005$). It is associated with the most common indication for vaginal hysterectomy, which was uterine myoma (55.5%). Thus, it required a special technique to remove the large uterus through the vagina. The result is consistent with findings of Benassi et al that vaginal hysterectomy in the enlarged uterus takes longer time than abdominal hysterectomy; however hospitalization time is shorter, without an increase in complication rates.¹²

Analysis of the estimated blood loss identified a significant difference between both groups, abdominal hysterectomy causes greater blood loss than vaginal hysterectomy ($p=0.002$). The result is consistent with numerous studies confirming that abdominal hysterectomy results in greater blood loss than vaginal hysterectomy in cases of uterine enlargement.^{16,17}

Incidence of urinary retention obtained in this study is 33.3% for vaginal hysterectomy and 31.6% for abdominal approach. The difference of incidence rate, which in this study had a significant difference, is more pronounced compared to the existing literature. This is due to the variation of definition and limitation of urinary retention, smaller sample size, and no measurement of preoperative post-voiding urine volume (PVR/Post-void residual volume). Assessment of PVR is an indicator of the efficiency in urination. If PVR is increased in preoperative condition, due to impaired contractility, obstruction, or both mechanisms, it will be a risk factor for postoperative urinary disorders.¹⁸

There is no difference in the incidence of urinary retention between the two groups. This finding is supported by the theory that the technique of either TVH or TAH does not cause extensive damage to the innervation of the bladder; thus it does not contribute to significant urinary disorders. It is

also consistent with a Cochrane⁹ study that stated the risk of urinary disorders between TVH and TAH is not different, as well as a study by Kavi et al¹⁶, which showed that vaginal hysterectomy is safe with no increase of complication rates compared to abdominal hysterectomy. Similar results were also obtained by Duru et al¹⁹, where hysterectomy for the indication of benign gynecological disorders does not affect the outcome of urodynamic function and no increased risk of urinary disorders.

CONCLUSION

We found no significant difference in the occurrence of urinary retention in vaginal compared to abdominal hysterectomy for benign gynecological disorders. However, further research is needed with a larger sample size, using prospective cohort method, involving many teaching hospitals, and including preoperative measurement of post-void residual urine volume (PVR) to establish the effect of different hysterectomy approach on the risk of urinary retention.

REFERENCES

1. Lambaudie E, Boukerrou M, Cosson M, et al. Hysterectomy for benign lesions: preoperative and early postoperative complications. *Ann Chir* 2000; 125(4): 340-5.
2. Clarke A, Black N, Rowe P, et al. Indications for and outcome of total abdominal hysterectomy for benign disease: a prospective cohort study. *Br J Obstet Gynaecol* 1995; 102(8): 611-20.
3. Hasson HM. Cervical removal at hysterectomy for benign disease. Risks and benefits. *J Reprod Med* 1993; 38(10): 781-90.
4. Cosson M, Lambaudie E, Boukerrou M, et al. Vaginal, laparoscopic, or abdominal hysterectomies for benign disorders: immediate and early postoperative complications. *Eur J Obstet Gynecol Reprod Biol* 2001; 98(2): 231-6.
5. Possover M, Stober S, Plaul K, et al. Identification and preservation of the motoric innervation of the bladder in radical hysterectomy type III. *Gynecol Oncol* 2000; 79(2): 154-7.
6. Abdel-Fattah M, Barrington J, Yousef M, et al. Effect of total abdominal hysterectomy on pelvic floor function. *Obstet Gynecol Surv* 2004; 59(4): 299-304.
7. Hoskins WJ, editor. Principles and practice of gynecologic oncology. 3rd ed. Philadelphia: Lipincott, Williams & Wilkins; 2000.
8. Kovac SR. Clinical opinion: guidelines for hysterectomy. *Am J Obstet Gynecol* 2004; 191(2): 635-40.
9. Nieboer TE, Johnson N, Lethaby A, et al. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2009(3): CD003677.

10. American College of Obstetrician and Gynecologists. Quality assurance in obstetrics and gynecology. Washington (DC): The College; 1989.
11. Kovac SR. Hysterectomy outcomes in patients with similar indications. *Obstet Gynecol* 2000; 95: 787-93.
12. Benassi L, Rossi T, Kaihura CT, et al. Abdominal or vaginal hysterectomy for the enlarged uteri: a randomized clinical trial. *Am J Obstet Gynecol* 2002; 187: 1561-5.
13. Baldini G, Bagry H, Aprikian A, et al. Postoperative urinary retention: anesthetic and perioperative considerations. *Anesthesiology* 2009; 110(5): 1139-57.
14. Tammela T. Postoperative urinary retention - why the patient cannot void. *Scand J Urol Nephrol* 1995; 175(Suppl): 75-7.
15. Bodker B, Lose G. Postoperative urinary retention in gynecologic patients. *Int Urogynecol J Pelvic Floor Dysfunct* 2003; 14(2): 94-7.
16. Kavi F, Mathew V, Peter N. Vaginal versus abdominal hysterectomy for the enlarged non-prolapsed uterus: a retrospective cohort study. *Eur J Obstet Gynecol Reprod Biol* 2014; 174: 111-4.
17. Hwang JL, Seow KM, Tsai YL, et al. Comparative study of vagina, laparoscopic assisted vaginal and abdominal hysterectomies for uterine myoma larger than 6 cm in diameter or uterus weighing at least 450 g: a prospective randomized study. *Acta Obstet Gynecol Scand* 2002; 81(2): 1132-8.
18. Hari S, Angelo E. *Female Urology*. 3rd ed. Philadelphia: Elsevier; 2008: 178-86.
19. Duru C, Jha S, Lashen H. Urodynamic outcomes after hysterectomy for benign conditions: a systematic review and meta-analysis. *Obstet Gynecol Surv* 2012; 67(1): 45-54.