Vaginal Hysterectomy: Analysis of Cases Performed at a Single Center Over a Five Year Period

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Abstract

Introduction and Hypothesis: Vaginal hysterectomy is a procedure which follows all the parameters of minimally invasive surgery. Because of the lower risk of intraoperative complications, possibility of using regional anesthesia, reduced infective morbidity, lesser pain and early return to routine activities, vaginal hysterectomy should be performed in preference to abdominal hysterectomy where possible. It can often be safely performed in women with prior caesarean section, nulliparity and a bulky uterus, after a thorough patient assessment. Long term follow up data from various studies show a low incidence of vault prolapse. Where feasible, the vaginal route should be preferred for hysterectomy.

Methods: It was a retrospective study in which the case notes of 336 patients undergoing vaginal hysterectomy at a single center over a 5 year period were retrieved. The demographic profile, intraoperative and postoperative data and five year follow up details of these patients was evaluated.

Results: The average age of the patients was 57 years and the most common indication for surgery was uterovaginal prolapse (81.8%). The mean duration of surgery was 61.6 min and the average blood loss was 50.1 ml. Four patients (1.2%) had intraoperative complications. Six patients (3.3%) had grade 2 or more vaginal vault prolapse at 5 year follow up.

Conclusion: Vaginal hysterectomy is safe and cost effective, and should be the approach of choice for hysterectomy whenever feasible in view of its advantages and lower complication rates. It can often be safely performed even in the presence of generally accepted contraindications.

Keywords: Vaginal Hysterectomy; Prolapse; Complications; Contraindications

Introduction

Vaginal hysterectomy is a procedure which follows all the parameters of minimally invasive surgery [1]. It has been long-practiced and has even been mentioned in the descriptions of Berengario de Carpi (1470-1550) [2]. When choosing the route and method of hysterectomy, safety and cost effectiveness must be kept in consideration [3]. Because of the lower risk of intraoperative visceral injury, possibility of using regional anesthesia, reduced infective morbidity, lesser pain and earlier return to normal activities, vaginal hysterectomy should be performed in preference to abdominal hysterectomy where possible [3,4]. Where this is not possible, laparoscopic hysterectomy may avoid the need for an abdominal hysterectomy. However, the length of the surgery increases as the extent of the surgery performed laparoscopically increases and there is a greater risk of substantial bleeding and damage to the urinary bladder and ureters when compared to vaginal hysterectomy [5,6]. No benefits were found for laparoscopic versus vaginal hysterectomy in a few studies [5,6].

While the most common indication for a vaginal hysterectomy is pelvic organ prolapse, its use is not limited to urogynecology and pelvic floor reconstructive surgery. Other indications include uterine fibroids, adenomyosis, abnormal uterine bleeding, endometrial hyperplasia or early endometrial malignancy and cervical intraepithelial neoplasia [7,8].

Studies have concluded that a large uterus (>14 weeks size), nulliparity, previous caesarean delivery, pelvic laparotomy or need for oophorectomy rarely constitute contraindications to vaginal hysterectomy [8-13]. Doucette et al. [9] have reported that if the vagina can allow access to divide the uterosacral and cardinal ligaments, uterine mobility is usually increased enough to allow vaginal hysterectomy, even in cases where there is minimal uterine descent [9]. When the uterus is

enlarged, vaginal hysterectomy often can be accomplished safely by using uterine size reduction techniques such as wedge morcellation, uterine bisection and intramyometrial coring [12,14]. In patients with large uterine fibroids vaginal hysterectomy can be attempted if the surgeon is familiar with uterine morcellation, resources to convert to an abdominal route expeditiously are available, the size of the pelvis allows adequate exposure and the contour of the fibroid allows some degree of uterine descent [15]. In a study by Davies et al, the proportion of vaginal hysterectomies performed can be increased by a factor of 6 if the criteria for vaginal hysterectomy is extended to patients without clinically significant prolapse [13].

The vaginal axis is better maintained after a vaginal or laparoscopic hysterectomy than after an abdominal hysterectomy [16]. Completing a procedure vaginally could substantially decrease the total operative cost, in part because of its low associated morbidity rates [17-19]. It can be successfully adopted as a same-day discharge procedure [20].

Materials and Methods

We conducted a retrospective, descriptive, non-comparative study in women undergoing vaginal hysterectomy for various indications between January 1st, 2007 to December 31st, 2011 at KK Women's and Children's Hospital, Singapore. Inclusion criteria were medical indication for vaginal hysterectomy like pelvic organ prolapse, uterine fibroid, abnormal uterine bleeding and cervical intraepithelial neoplasia. Patients with concomitant vaginal mesh insertion or sacrospinous ligament fixation were excluded from the study. All surgeries were performed by the same surgical team. The Centralized Institutional Review Board (CIRB) approval was taken before the commencement of the study.

The medical records of these patients were retrieved and their demographic data was analyzed. The preoperative findings including the degree of prolapse, as assessed by the Baden-Walker classification system were noted. The intra-operative details like concomitant surgeries, type of anesthesia, and mean duration of surgery, mean blood loss, intra-operative complications and weight of the uterus were analyzed. Postoperative complications, length of hospital stay, duration of catheterization, histology report of the uterus, readmission rate and reason for readmission were noted.

Patients were followed up post operatively in the urogynecology clinic at 3 days after discharge and then at 1 month, 6 months, 1,2,3,4 and 5 years postoperatively. At all these visits, patients were assessed for symptoms of vaginal vault prolapse, urinary incontinence, voiding difficulty or dyspareunia and a clinical examination was done.

The data was analyzed using the SPSS software with frequency, mean and standard deviation used for quantitative variables. Chi square test was used for analyses in patients with concomitant procedures who had longer duration of surgery, more blood loss, longer duration of hospital stay and greater re-catheterization rates. The difference was considered significant at a P value equal to or less than 0.05.

Results

A total of 1,024 women underwent vaginal hysterectomy for various indications between January 1st, 2007 and December 31st, 2011. Of these, 774 case notes could be retrieved. Four hundred and thirty eight patients underwent concomitant vaginal mesh placement or sacrospinous ligament fixation and were excluded from the study. Three hundred and thirty six patients were included in the study. The mean age of the patients was 57 years with the youngest patient being 35 years old and the oldest aged 86 years. The mean parity was 2.9. Ninety-six percent of them had previous vaginal deliveries (Table 1). The pre-operative symptoms included lump coming out of the vagina in 82.1 percent, voiding difficulty in 3% and stress urinary incontinence in 37.5 percent of the patients (Table 2).

Twenty nine percent of women had grade 3 cystocele to 4 cystocele on pre-operative examination, 58 percent of them had grade 3 to 4 uterovaginal descent and 32.5 percent had grade 3 rectocele to 4 rectocele. Thirty eight percent of them had demonstrable stress urinary incontinence (Table 3).

The indication for vaginal hysterectomy was uterovaginal prolapse in 81.8 percent of these women, fibroid uterus in 14 percent,

Table 1: Demographic characteristics.

Patient's Characteristics	N=336
Age (years) mean ± SD (range)	57.0 ± 10.2 (35–86)
Parity mean ± SD (range)	2.9 ± 1.6 (0–13)
Previous vaginal delivery n (%)	323 (96.1)
Previous Caesarean delivery only n (%)	4 (1.2)
Nulliparous n (%)	9 (2.7)
Sexually active n (%)	153 (45.5)
Postmenopausal n (%)	217 (64.6)

Table 2: Preoperative symptoms.

Pre-operative Symptoms	N=336
Lump at Introitus n (%)	276 (82.1)
Voiding Difficulty n (%)	10 (3.0)
Urgency n (%)	74 (22.0)
Urge Incontinence n (%)	43 (12.8)
Stress UI n (%)	126 (37.5

Table 3: Preoperative examination.

Pre-operative Symptoms	N=336
Cystocele n (%)	
(a) Grade 0	86 (25.6)
(b) Grade 1	45 (13.4)
(c) Grade 2	108 (32.1)
(d) Grade 3	93 (27.7)
(e) Grade 4	4 (1.2)
Cervical Descent n (%)	
(a) Grade 0	24 (7.1)
(b) Grade 1	24 (7.1)
(c) Grade 2	179 (53.3)
(d) Grade 3	94 (28.0)
(e) Grade 4	15 (4.5)
Rectocele n (%)	
(a) Grade 0	53 (15.8)
(b) Grade 1	88 (26.2)
(c) Grade 2	180 (53.5)
(d) Grade 3	13 (3.9)
(e) Grade 4	2 (0.6)
SUI n (%)	128 (38.1)

Table 4: Intraoperative details.

Parameters	N=336
Indication for surgery n (%)	
(a) Uterovaginal prolapse	275 (81.8)
(b) Fibroids	47 (14.0)
(c) Adenomyosis	19 (5.7)
(d) Cervical Intraepithelial Neoplasia (CIN)	4 (1.2)
Anaesthesia n (%)	
(a) Regional	88 (26.2)
(b) General	248 (73.8)
Patients with concomitant surgeries n (%)	
(a) Pelvic floor repair	153 (45.5)
(b) Mid urethral sling	131 (39.0)
(c) Oophorectomy (vaginally)	12 (3.6)
Duration of surgery (min) mean ± SD (range)	
(a) Mean	61.6 ± 21.9 (24–155)
(b) Vaginal Hysterectomy (VH)	51.9 ± 16.6 (24–91)
(c) VH + Pelvic Floor Repair (PFR)	56.8 ± 20.1 (25–130)
(d) VH + Mid urethral tape	71.0 ± 22.4 (27–155)
Blood Loss (ml) mean ± SD (range)	
(a) Mean	50.1 ± 47.0 (5–400)
(b) VH	61.4 ± 57.5 (5–300)
(c) VH + PFR	47.3 ± 46.8 (5–400)
(d) VH + Mid urethral tape	48.9 ± 42.1 (5–300)
Weight of uterus (g) (n = 329) mean ± SD (range)	
(a) Mean ± SD (range)	101.6 ± 82.7 (20–533)
(b) <200 n (%)	291 (88.4)
(c) 200 – <300 n (%)	28 (8.5)
(d) ≥ 300 n (%)	10 (3)
Intraoperative complications n (%)	4 (1.2%)
(a) Bladder Perforation	1
(b) Rectal Perforation	3
Histopathology n (%)	
(a) Normal	267 (79.5)
(b) Fibroids	167 (49.7)
(c) Adenomyosis	97 (28.9)
(d) Endometrial hyperplasia/carcinoma	14 (1.7)
(e) Cervical Intraepithelial Neoplasia (CIN)	7 (0.9)

Table 5: Immediate postoperative details.

Parameters	N=336
Length of stay (days) mean ± SD (range)	2.9 ± 1.2 (1 – 12)
Length of catheterization (days) mean ± SD (range)	2.6 ± 3.2 (1 – 28)
Postoperative fever n (%)	7 (2.1)
Postoperative urinary tract infection n (%)	10 (3.0)
Readmissions n (%)	8 (2.4)
(a) Voiding difficulty after TVT (for tape loosening/division)	2
(b) Staging surgery for endometrial malignancy	3
(c) Pelvic hematoma	1
(d) Urinary tract infection	1
(e) Repair of rectovaginal fistula	1

adenomyosis in 5.7 percent and carcinoma in situ of the cervix in 1.2 percent, with some patients having more than one indication (Table 4). One hundred and thirty one patients (39%) had concomitant midurethral sling insertion, 153 (45.5%) had concomitant pelvic floor repair and 12 (3.6%) had oophorectomy along with vaginal hysterectomy. None of the patients needed conversion to an abdominal approach.

The average duration of the surgery was 61.6 min for all cases, 51.9 min in patients who underwent only vaginal hysterectomy, 56.8 min for patients with concomitant pelvic floor repair and 71 min for patients with concomitant midurethral sling insertion. The mean blood loss was 50.1 ml. Intra-operative complications occurred in 4 (1.2%) patients of which 1 had bladder perforation during midurethral sling insertion and 3 had rectal perforation. The average weight of the uterus was 101.6 g. The weight was more than 300 g in 10 patients (Table 4).

The average length of hospital stay was 2.9 days and the average duration of catheterization was 2.6 days. Postoperative complications included fever in seven patients, urinary tract infection in 10 patients and readmission for various reasons in 8 patients (Table 5).

The histology of the uterus revealed uterine fibroids in 49.7 percent of the patients and adenomyosis in 28.9 percent. Endometrial hyperplasia or endometrial carcinoma was reported in 1.7% of the patients and carcinoma *in situ* of the cervix in 0.9 percent.

Three hundred and five patients (90.8%) complied with the 6 months post-operative follow up and 180 (53.6%) complied with the 5 year post-operative follow up. The post-operative symptoms included lump at the introitus in 3 patients at 5 year postoperative follow up, *de novo* urgency and urge incontinence in 11 patients and stress urinary incontinence in 14 patients (Table 6).

At the five year post-operative examination, 13 of the 180 patients (7.2%) had grade 2 or more cystocele. Six patients (3.3%) had grade 2 or more rectocele, six (3.3%) had grade 2 or more vaginal vault descent. None of the patients had demonstrable SUI (Table 7).

Ten of the 336 patients (3%) required repeat surgery for vaginal vault prolapse or SUI during the follow up period. Four patients underwent vaginal mesh repair and three underwent pelvic floor repair with sacrospinous ligament fixation for recurrent vaginal vault prolapse. Three patients underwent midurethral sling insertion for de novo SUI.

Discussion

Despite most literature supporting the view that vaginal hysterectomy is the safest and most cost-effective route for removal of the uterus, analysis of the US surgical data shows that abdominal hysterectomy is performed in 66% of cases, vaginal hysterectomy in 22% of cases and laparoscopic hysterectomy in 12% of cases [21]. Teaching hospital status had minimal influence on the route of hysterectomy in one study [22]. In a randomized trial, when residents followed specific guidelines for selection and performance of hysterectomy, the percentage of vaginal hysterectomies performed for benign conditions rose to more than 90% [23]. In a study by Varma et al. [24], the percentage of hysterectomies performed vaginally rose to 95% when a deliberate decision to perform as many

Table 6: Symptoms on postoperative follow up.

	6 months (N=336)	1 year (N=336)	2 years (N=336)	3 years (N=336)	4 years (N=336)	5 years (N=336)
Follow-up rate n (%)	305 (90.8)	283 (84.2)	251 (74.7)	221 (65.8)	193 (57.4)	180 (53.6)
Lump at Introitus n (%)	1 (0.3)	5 (1.8)	1 (0.4)	2 (0.9)	2 (1.0)	3 (1.7)
Voiding Difficulty n (%)	0	0	0	0	0	0
De novo urgency n (%)	24 (7.9)	23 (8.1)	16 (6.4)	10 (4.5)	7 (3.6)	11 (6.1)
De novo Urge Incontinence n (%)	17 (5.6)	14 (4.9)	13 (5.2)	8 (3.6)	5 (2.6)	11 (6.1)
De novo SUI n (%)	11 (3.6)	10 (3.5)	8 (3.2)	6 (2.7)	9 (4.7)	14 (7.8)
Pain n (%)	1 (0.3)	0	0	0	1 (0.5)	0
Dyspareunia n (%)	1 (0.3)	0	0	0	0	0

Table 7: Postoperative follow up examination.

	6 months (N=336)	1 year (N=336)	2 years (N=336)	3 years (N=336)	4 years (N=336)	5 years (N=336)
Follow-up rate n (%)	305 (90.8)	283 (84.2)	251 (74.7)	221 (65.8)	193 (57.4)	180 (53.6)
Grade ≥ 2 Cystocele n (%)	10 (3.3)	11 (3.9)	10 (4.0)	6 (2.7)	9 (4.6)	13 (7.2)
Grade ≥ 2 Rectocele n (%)	1 (0.3)	1 (0.3)	3 (1.2)	4 (1.8)	4 (2.1)	6 (3.3)
Grade ≥ 2 Vault descent n (%)	3 (0.9)	3 (0.9)	1 (0.4)	2 (0.9)	4 (2.1)	6 (3.3)
SUI n (%)	0	2 (0.7)	0	0	0	0
Reoperation n (%)	0	1 (0.3)	4 (1.8)	1 (0.4)	1 (0.5)	3 (1.7)

hysterectomies as possible by the vaginal route was made [24]. Moen et al. [25] suggested the use of the term "no-incision" hysterectomy for vaginal hysterectomy may help patients in understanding its value in comparison to other routes of hysterectomy [25].

The purpose of this study was to analyze the pre and perioperative factors and the outcome measures of vaginal hysterectomy. Among the patients studied, there were 9 nulliparous women and four patients with no previous vaginal deliveries, with two of them having undergone two previous caesarean sections. Vaginal hysterectomy was possible in all of these patients without any intraoperative complications. Augustine et al. [26] in their study on vaginal hysterectomy in nulliparous women without prolapse found that the success rate in multiparous women was more than that in nulliparous women, but the difference was not statistically significant [26]. The difference in success rates may be explained by the technical difficulty due to a narrower vagina and lesser uterine descent in nulliparous patients. The rate of complications for nulliparous women was three fold higher in their study. Poindexter et al. [27] in their study did not find a higher complication rate in women with up to three previous caesarean sections undergoing vaginal hysterectomy [27]. Similar observations were made by Unger et al. [28] and Sheth et al. [29] in their studies on women with previous caesarean section undergoing hysterectomy through the vaginal route [28,29].

Pakbaz et al. [30] in their study on vaginal hysterectomy in women with prolapse reported an average duration of surgery of 76 min and a mean blood loss of 128 ml [30].

In our study, there were 10 patients in whom the uterus weighed more than 300 grams. Vaginal hysterectomy was possible in all these cases with the weight of the largest uterus removed vaginally being 825 grams. The average duration of surgery in these patients was 73.9 min and the average blood loss was 78.7 ml. Sheth et al. [31] in their study reported that five patients needed conversion to a laparotomy when the uterine volume was more than 500 cm³ [31]. Furuhashi et al. [32] in their study comparing complications of vaginal hysterectomy in patients with leiomyomas to those with adenomyosis reported that there was no significant difference in the operative time and estimated blood loss between the two groups when they were analyzed based on uterine weight but patients with adenomyosis had an increased risk of bladder injury [32].

Oophorectomy was possible vaginally in all 12 cases where it was attempted. It was done for various indications like ovarian cyst, endometrial hyperplasia or early endometrial carcinoma and on patient request. Sheth et al. [31] in their study reported that prophylactic oophorectomy was possible during vaginal hysterectomy in 1,510 of 1,572 cases (96%), without laparoscopic assistance [30]. Davies et al. [33] reported a 97.5% success rate in performing oophorectomy at the time of vaginal hysterectomy [33].

The incidence of major intraoperative complications was 1.2% in our study. One of the patients with rectal perforation which was repaired intraoperatively developed a rectovaginal fistula and had to be readmitted for repair of the fistula [34]. Bhattacharya et al. [35] reported an overall complication rate of 4% in their series of 1,105 cases of vaginal hysterectomy [33,35]. They reported a primary hemorrhage rate of 0.81 percent and a secondary hemorrhage rate of 0.45%. Rectal perforation occurred in 9 patients. Pakbaz et al. [30] in their study on 941 patients undergoing vaginal hysterectomy reported 9 cases of reoperation after vaginal hysterectomy for indications like intraperitoneal or retroperitoneal bleeding, bleeding from sutures, vaginal vault abscess and urinary retention after Tension free Vaginal Tape [30]. Rizvi et al. [34] reported a 4.2% intraoperative hemorrhage rate and 0.2% incidence of bladder injury in 430 patients undergoing vaginal hysterectomy. 12/468 (2.6%) of the patients had postoperative fever, 20 (4.7%) required blood transfusion and 7 (1.6%) had urinary tract infection [34].

In our study, eight patients were readmitted for various reasons like for TVT tape excision or loosening in patients who had postoperative urinary retention, staging surgery for endometrial malignancy, urinary tract infection requiring intravenous antibiotics and repair of rectovaginal fistula. In the study by Pakbaz et al. [30], 14 out of the 941 patients required readmission for indications like thrombosis, ileus, vaginal vault abscess and urinary retention [30].

There was no mortality in our case series. Sheth et al. [31] reported 2 fatalities in their series of over 5,655 vaginal hysterectomies [31,35].

Six (3.3%) of the 180 patients followed up till five years postoperatively developed grade 2 or more vaginal vault prolapse. Marchionni et al. [36] reported an 11.6 percent incidence of vault prolapse in women who had previous hysterectomy for prolapse and 1.8% when hysterectomy had been performed for other indication [36].

Liang et al. [37] in their study on postsurgical urinary incontinence in continent women undergoing hysterectomy for vaginal prolapse concluded that neither urodynamics nor clinical examination predict with 100 percent certainty which women with pelvic organ prolapse will benefit from a prophylactic anti incontinence procedure during prolapse repair surgery [37].

Strengths of the present study are the large number of patients studied and the long postoperative follow up duration. Weaknesses are that it is a retrospective study and not all case notes could be retrieved.

Conclusion

In conclusion, vaginal hysterectomy is safe and cost effective, and should be the approach of choice for hysterectomy whenever feasible in view of its advantages and lower complication rates. It can often be safely performed even in the presence of generally accepted contraindications like prior caesarean section, nulliparity and bulky uterus, after a thorough patient assessment. Long term follow up shows a low incidence of vaginal vault prolapse.

Declaration

Authors' contributions

- P Singh: Data analysis, manuscript writing/editing.
- MAC Donsen: Protocol development, data collection.
- HC Han: Protocol development, manuscript editing.

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