Research Article

Assessment of role of Uterine Volume in Decision Making for the Route and Technique of Hysterectomy

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Abstract

Objective: To assess the value of uterine volume estimated by ultrasound sonography in decision making for route and technique of hysterectomy. **Methods:** Uterine volume was measured by ultrasound sonography in 50 cases posted for hysterectomy. Intra operative difficulties, accessibility and ease of surgery were noted. Also, uterine weight postoperatively was compared with the volume. **Results:** Vaginal hysterectomy was done without difficulty up to 300cm³. With uterine volume more than 300cm³, debulking was more frequently required. In patients with uterine volume greater than 500cm³, i.e., approximately more than 16 weeks pregnant uterus size the surgeons preferred abdominal rather than vaginal route. Uterine volume correlated well with the uterine weight measured post operatively. **Conclusion:** Uterine volume measured by ultrasound sonography was found to correlate with uterine weight measured post operatively. It played an important role in assessing the feasibility of vaginal hysterectomy.
Keywords: hysterectomy, uterine volume.

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INTRODUCTION

Hysterectomy is one of the most common surgical procedures not related to pregnancy performed by the gynecologists on women in India. It can be performed by abdominal and vaginal route. Vaginal hysterectomy has many advantages over the abdominal hysterectomy and it is reported to be appropriate for around 80% of benign uterine conditions.[1, 2] Preoperative documentation of uterine size in vivo can help to prevent abdominal hysterectomy being selected unnecessarily.[3] The feasibility of vaginal hysterectomy is judged primarily on the findings at bimanual pelvic examinations, especially under anaesthesia. Bimanual pelvic examination gives three dimensional idea of the size of the uterus. However, in practice decision is made utilizing only one dimension i.e. uterine length (which denotes the uterine size in weeks) by almost all gynaecologists. The present study was done to assess the significance of pre-operative estimation of uterine volume by ultrasonography in decision making regarding route of hysterectomy as well as for anticipating problems during hysterectomy.

METHODS

Cases for the present study were taken from the Women and Children hospital, Bapuji Hospital and Chigateri General Hospital, Davanagere from the period of Oct 2008 to July 2010. Total number of cases under the study was 50. These patients were admitted to Gynaecology wards of the above hospitals and were scheduled for elective inpatient hysterectomy for various indications. Data was collected i.e. patient's age, indications for hysterectomy, detailed clinical history which included patient's complaints, duration, menstrual and obstetric history, any significant past, family and personal history.

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Clinical Examination included a detailed general physical examination and systemic examination. Per abdominal examination was done for any previous surgical scars, any palpable mass or tenderness. Vulvo - Vaginal examination, per speculum examination, bimanual examination were done to identify pelvic pathology. Pre-operative investigations included haemoglobin percentage, urine for albumin, sugar, microscopy, HIV, HBsAg, blood group and Rh typing, FBS/RBS, blood urea, serum creatinine, ECG, pre-operative ultra sonography for large uterine fibroid. After making primary diagnosis, the route of hysterectomy was decided. The decision of the route depends on the following factors: Surgeons experience, Assessment of the uterine size by bimanual examination, Assessment of the mobility and the descent of the uterus, Ultrasonography assessment of the uterine size and the volume, Myoma Mapping. Ease and difficulties encountered during surgery and time taken for the surgery were noted. Post operative uteri were weighed and compared with the uterine volume estimated preoperatively. Inclusion criteria were: Women scheduled for hysterectomy with uterine volume <700cm³ and Indications were benign disorders like DUB, fibroids, adenomyosis. Exclusion criteria were Uterine volume >700cm³ or uterine size 18 - 20 weeks size, factors like restricted uterine mobility or presence of adnexal pathology.

RESULTS

Table 1: Comparison of uterine size in weeks and Uterine Volume

Uterine Size (In weeks)	Uterine Volume (cm^3)
6-8	100-242
10-12	134-556
14-16	150-525
18	500-600

As shown in Table 1, there was increase in uterine volume along with an increase in uterine size in weeks. However, there was some degree of variation found in the relationship between uterine size in weeks and uterine volume as reflected in the Table.

Table 2: Comparison of Uterine volume (ml) and Uterine Weight (gm)

Uterine volume (ml)	Uterine Weight (gm)
100-200	90-200
200-300	100-250
300-400	250-350
400-500	300-400
> 500	400-600

As shown in the above table, there is a positive correlation between uterine volume and uterine weight measured post operatively.

Table 3: Route of Hysterectomy for all the cases

Uterine Volume (cm^3)	100-200	201-300	301-400	401-500	>500
Number of cases	18	9	9	6	8
Vaginal Route of Hysterectomy	17	9	8	4	1
Abdominal Route of Hysterectomy	1	--	1	2	7
Debulking	2	3	7	4	1
Uterus free pelvic space	Plenty	Adequate	Decreased	Inadequate	Inadequate
Range of time required for surgery (minutes)	30-45	30-45	30-50	30-60	45-60

As shown in Table 3, uterine descent, access excision and delivery of the uterus encountered difficulty as uterine volume increased. When the volume was between 100 – 200 cm³, vaginal hysterectomy (VH) was performed easily. In one case abdominal hysterectomy (AH) was performed as per surgeon's preference. For volume between 200-300 cm³, VH was feasible, but required debulking in 3 cases. With uterine volume 300-400 cm³, one case underwent AH as there was a left sided ovarian cyst. Of all the 8 cases, 7 cases required debulking. For volume 400-500 cm³, trial of VH was considered for 6 cases of which 2 underwent AH as they had posterior wall fibroid impacted in the pelvis causing urinary retention. In cases with uterine volume more than 500 cm³, one case underwent VH. The volume was 515 cm³. Debulking was done by bisection, Morcellation and Myomectomy. Morcellation was done in 11 cases of which 3 cases had uterine volume 200-300 cm³ and 9 cases had volume >300 cm³. Bisection was done for 14 cases of which 2 had volume >200 cm³ and 12 had volume >300 cm³. Myomectomy was done in 3 cases were the volume was >300 cm³.

The greater the volume, the longer it took to complete the hysterectomy. The average time required increased by 10-15 minutes as the volume increased to more than 400 cm³.

DISCUSSION

In the present study, it was observed that vaginal hysterectomy was done without difficulty up to 300cm³

and with debulking up to 400 cm^3. With uterine volume more than 500cm^3, i.e., approximately more than 16 weeks pregnant uterus size the surgeon preferred abdominal rather than vaginal route. So, it was concluded that up to 300 cm^3 of uterine volume, vaginal route of hysterectomy should be the preferred route and if volume is more than 400cm^3, vaginal hysterectomy should be considered as a trial and proceeded with. With uterine volume greater than 300 cm^3, expertise and pelvic factor play a major role in determining the route. The choice of vaginal or abdominal route is an important decision as it has been found that vaginal hysterectomy is associated with quicker recovery, early mobilization, and shorter hospitalization, less operative and post operative morbidity when compared to abdominal hysterectomy. [3, 5, 6, 7] In study conducted by Sheth & Shah [4], 380 women with enlarged uteri of size up to 18-20 weeks size underwent preoperative sonography estimation of the uterine volume. They were scheduled for VH. Up to 400 cm^3 no difficulties were encountered for VH. For volume more than 400cm^3, debulking was required in all cases as well as greater skill of the surgeon. VH failed in 4 cases with the uterine volume 500- 700 cm^3. Our study has limitations of a smaller sample size and observational study design. Further robust and longitudinal studies in large sample of population and different centres need to be done to further the understanding on the subject. To conclude, pre operative assessment of uterine volume can be of help in deciding the route of hysterectomy and in anticipating difficulties during surgery in cases of larger uterus. It can play a role in counseling the patient and her family members pre-operatively.

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