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Comparison of various surgical approaches to hysterectomy in benign gynaecological conditions at a peripheral zonal hospital.

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Abstract
Comparison of various surgical approaches to hysterectomy in benign gynaecological conditions at a peripheral zonal hospital.
Introduction
Hysterectomy is a common gynaecological surgery performed for numerous indications. Selection of an approach is dependent on set up and availability of recourses as well as patient characteristics.
Material and methods
We evaluated all cases of hysterectomy over last two year. The patient characteristics and the outcome were assessed.
Results
The Vaginal approach took least operative time and had lowest complication rate. Ladies with previous surgery and larger size of uterus were more likely to undergo abdominal hysterectomy. Duration of hospitalisation was comparable for vaginal and laparoscopic hysterectomy.
Conclusion
Various approaches for hysterectomy are adapted based on patient profile and resources with availability of skills available in the set up. Traditional approach by abdominal and vaginal route remains widely used. With adaptation based on learning curve laparoscopic approach is gaining acceptance.
Key Words; *Hysterectomy, Morcellation, Nondescent vaginal Hysterectomy.*

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I. Introduction

Hysterectomy is a widely used major surgical operation in Gynaecology clientele. Route and indication are varied and differ from social status profile, educational level, parity and region. Likelihood of undergoing this intervention is obesity, high parity and low age at marriage[1]. A large district level health survey of 316631 ladies across various states and UT found prevalence of hysterectomy of about 17 per 1000 ever married ladies. Incidence varied across states from 2 to 63 per 1000 ladies. About 2/3 of ladies were aged below 40 years at the time of operation[2].

Aim of the study was to critically analyse all cases operated at a peripheral hospital. The indication and operative approaches were analysed to assess the common route, operative time and complication associated with each route.

II. Material And Method

All cases operated over one year were analysed. The operation notes and ward records were compiled to assess the indication of surgery, the time taken and complications involved.

All cases worked up for hysterectomy after optimisation of other medical and surgical co morbidities were enrolled in the study. All Benign cause warranting hysterectomy were included in the study cohort. All malignant or premalignant uterine and cervical pathologies were excluded from the study. Ladies with symptomatic uterine descent with prolapse were also not included in the study. Large myoma beyond 24 wk gravid uterus size was also excluded from the study. Patients were distributed to vaginal abdominal or laparoscopic approach to Hysterectomy.

Approach was decided based on accessibility, availability of resources at the time of surgery, availability of trained attendants and patient consent. Abdominal hysterectomy was done through Joel kohen incision by standard technique. Non-descent vaginal hysterectomy was done following hydro dissection. Laparoscopic hysterectomy was done using bipolar and harmonic as energy source. Decision to perform

oophorectomy was based on individual patient characteristics. Antibiotics were prescribed as per institutional Antibiotic policy. An analysis was carried out to compare various approaches.

Data were analysed with chi square test. Analysis of variance (ANOVA) was done for significance of difference in more than two means of different arms.

III. Results

1. Abdominal hysterectomy was done in 44% of our cohort. Second commonest choice was for nondescent hysterectomy. 40 to 45 years was the commonest age bracket of ladies undergoing hysterectomy. This was seen across all approaches to hysterectomy. Increase in BMI increased the risk of hystrectomy.76, 60 and 46% of ladies with BMI above 24 underwent abdominal, vaginal and laparoscopic hysterectomy respectively.
2. Larger size of uterus predisposed to abdominal approach in our study population. Of the 31 ladies with uterus more than 500g, 77% (24) were operated by abdominal approach. Fibroid uterus of varying size was the commonest indication in our cohort. Excessive and painful menstrual bleeding was the second commonest indication for hysterectomy in all approaches to hysterectomy.
3. Ladies with history of previous surgery were more likely to be operated abdominally in our cohort. 31 of 43 ladies (72%) with previous laparotomy underwent abdominal hysterectomy in our cohort of patients. Salpingectomy for primary prevention of genital malignancy was commonly done for abdominal and laparoscopic hysterectomy.
4. Routinely more than 70% of patients were discharged by day 3 of surgery. More than 82% of ladies in laparoscopic arm were discharged by day3. Commonest reasons for hospitalisation beyond day 3 were for febrile morbidity and administration of antibiotics. Blood transfusion was common for abdominal and laparoscopic hysterectomy. Wound infection or surgical site infection was commonest for abdominal approach to hysterectomy.
5. Bladder injury was the commonest iatrogenic injury during hysterectomy. Maximum incidence was for abdominal approach. Psychological upset occurred with equal frequency for all approaches to hysterectomy.

IV. Discussion

Hysterectomy is a widely used surgical treatment for varied benign pathologies of genital tract. The relative advantages and disadvantages of various approaches should be discussed between the patient and health care provider to reach a consensus about the appropriate approach[3]. In a survey by national family heath in year 2015-2016, of 6, 99,686 ladies in age group of 30 to 49 found that two thirds of all hysterectomy was conducted in private setup. At national level high age and parity, lack of formal school education, rural setup and high wealth status increases the odds of undergoing this intervention[4].Before deciding about operative intervention it is essential to educate patient about uterus conserving options. Exhaustion of all options of non surgical treatment is essential before proceeding for hysterectomy[5].

In our cohort conventional abdominal hysterectomy remains commonest route for this surgical option. In our cohort, due to various considerations 44% were done by abdominal route. Non descent vaginal hysterectomy and Laparoscopic hysterectomy were done in 31 and 25% of our patients. Age distribution showed maximum distribution in 40-45 year category. Across all approach to hysterectomy, increased BMI proved to be a risk factor. 76 and 60% of ladies had BMI in overweight category for ABD and vaginal hysterectomy. In laparoscopic hysterectomy arm more ladies had BMI in normal range. Fibroid uterus was the commonest indication for hysterectomy in our clientele. 61, 48 and 46 percent of ladies with abdominal, vaginal and laparoscopic hysterectomy respectively had fibroids of varying size. Abnormal and excessive menstrual bleeding was the second common reason for hysterectomy. Government of India national family survey also found likelihood of hysterectomy to be greater in ladies with higher parity and weight from rural background. This survey also found younger age at marriage, lower educational level predisposing to hysterectomy for various indications[1].

Obesity remains a risk factor for hysterectomy by predisposing the lady to numerous menstrual disturbances. Furthermore the surgical procedure carries its own risk due to anaesthetic risk and factors associated with prolonged operative time. In our cohort 76, 60 and 46% of ladies in Abdominal, Vaginal and laparoscopic hysterectomy arm were overweight or obese. There might be selection bias for laparoscopic hysterectomy for ladies with low BMI. Emad Mikhail et al in a retrospective analysis of 18810 hysterectomies found surgeons preferring abdominal hysterectomy over other approaches to hysterectomy for obese ladies. They also found increased operative time across all approaches with increased BMI. Increased chances of surgical site infection were seen in TAH group for obese ladies[6].

In our study population we found more patients in laparotomy group with history of previous surgery. Most common surgical procedure was caesarean section followed by cholecystectomy. Sofie Lindquist in an elaborate study of 5267 ladies found increased odds of complication in ladies with previous caesarean section. They also recommended efforts to reduce chances of primary cesarean sections[7].Salpingectomy (Uni/Bilateral) was done in 69, 13 and 43% of ladies along with abdominal, Vaginal and Laparoscopic hysterectomy. Incidence of oophorectomy in our clientele was 25, 3 and 20% respectively. Lesser associated salpingoophorectomy with vaginal hysterectomy may be due to technical difficulty. Elizabeth Casiano Evans in an systematic review found that although salpingoophorectomy effectively removes the risk of ovarian cancer and risks associated with reoperation it can be detrimental for psychosexual, cardiovascular, social and mental health of younger ladies with healthy ovaries[8].

Duration of surgery was maximum in laparoscopic approach. In this cohort maximum patients were discharged within 3 days as compared to abdominal and vaginal approach. With advances in learning curve some centres are doing same day discharge also called out patient hysterectomies for laparoscopic approach[9]. In our centre we routinely admit and observe patients for 48h post op. Vaginal hysterectomy is found to have a lowest operative time with least complication rate. The average operative time in our study was 53 minutes, compared to 63 min for TAH and 118 for laparoscopic hysterectomy. Evelien in a systemic review and Meta analysis found lesser operative time and complication rate for VH. Conversion to laparotomy was lesser as compared to Lap Hysterectomy[10].

Many factors affect the choice of approach and require a shared decision making by the patient and surgical team. Seung et al in a study of 1618 patient found lower complication rate and visual analogue pain score in ladies following vaginal hysterectomy. Lower operation times and associated benefits with warrant that that when both options are feasible VH should be preferred over LH[11].Ewa kala in an similar study of 565 patients found vaginal hysterectomy to be more cost effective in terms of duration of surgery and post op recovery period[12]. Jennifer J Schmitt et al also found shorter operative time, lower infection rate and lower cost with vaginal approach to hysterectomy. This should be preferred route whenever feasible[13]. Mariña Naveiro-Fuentes in a retrospective study over four years for ladies with BMI more than 30 found vaginal hysterectomy with least morbidity and complication rate. This should be preferred route whenever feasible especially in obese patients[14].

Abdominal hysterectomy is usually preferred for ladies with previous surgery. Commonest complication post op was wound infection. Abdominal hysterectomy when compared to laparoscopic hysterectomy usually takes less time. Total blood loss and operation room time is lesser. This may be because of more familiarisation with the procedure for the operating surgeon. Samantha et al in a study of 109821 hysterectomies found risk of sepsis less in TAH as compared to laparoscopic approach greater than 240 min, and also lower odds of urinary tract

infection[15]. Laparoscopic hysterectomy took longer time. Post op pain score was less. Wound complication was minimal. It was seen that time consumed was maximum for laparoscopic hysterectomy. It might be because of quality of instruments available in a peripheral hospital as well as learning curve and expertise in the procedure. Despite advances in minimally invasive surgery laparotomy remains common route for hysterectomy. TLH has positive impact on post op sexual function[16]. Surgical efficiency still is important deciding factor for any approach to this common surgical procedure. It was seen that preoperative medico-surgical morbidities and increased operative time were independently associated with increased morbidity post op[17].

Complication in laparoscopy was conversion to laparotomy. In 1% patient undergoing vaginal hysterectomy laparotomy was warranted. In 2 it was due to intractable bleeding. In 01 it was due to difficulty in opening anterior Uterovesicle fold. In laparoscopic approach 8 patients had to be converted to laparotomy. In maximal patient, (5) it was due to failure to achieve haemostasis. In 2 it was due to dense adhesions of omentum to anterior abdominal wall and uterus. In 01 patient it was due to failure of laparoscopic assembly

The distribution for various approaches for large size uterus, defined as more than 500g was 21,3 and 6% for Abdominal, vaginal and laparoscopic approach. More than 60% of ladies in Vaginal and laparoscopic approach had specimen weighing less than 250 g. Selection bias may be due to technical feasibility. It was seen that preferred approach was abdominal hysterectomy for larger uterus. In our cohort approx 80% of hysterectomies for uterus measuring above 500 g was done abdominally. There may be bias because of lack of equipment for Morcellation and skill against laparoscopic approach. Michelle et al found weight to be independent risk factor for post hysterectomy complication. When compared to ladies with uterus below 100g ladies with uterus around 500g, 750g and 1000g had 30%, 60% and 80% more likely complication rate. This was true for all comparison between abdominal and laparoscopic approach[18]. In the same study, analysis of 27167 ladies undergoing hysterectomies found that ladies with uterus more than 500g, 30% increased odd for any complication as compared to abdominal hysterectomy compared to laparoscopic hysterectomy. Increased uterine size is an independent confounder for risk of adverse outcome across all approaches to hysterectomy.

Laparoscopic assistance for hysterectomy may be utilised for reducing abdominal hysterectomies. In cases with previous surgery or larger size of uterus there is general trend to prefer abdominal approach. In our cohort of patients, seven cases (11%) were deemed inoperable and converted to laparotomy in the laparoscopy arm. Inoperability was due to dense adhesions and extreme distortion of anatomy. In remaining five the conversion to laparotomy was due to difficulty in bladder dissection (2) and inability to achieve haemostasis (3).

Commonest complication of urogenital tract was bladder injury. 4 patients in abdominal group and 2 in laparoscopic approach. One patient had superficial small intestinal injury managed conservatively in consultation with gastro intestinal surgeon. Bladder injury predominantly occurred on the posterior wall in the supratrigonal area during reflection from lower uterine segment. All of the injuries were identified and repaired during the primary surgery. There were no incidences of fistula across all approaches. Immediate identification and correct repair reduces the chances of genito urinary fistulas[19].A thorough informed consent especially in cases with previous surgery and endometriosis is essential. Injury to adjacent organs is always a probability across all approaches to hysterectomy[20].

Psychological upset is a wide spectrum of symptoms. It includes feeling of fatigue, weakness, insomnia, sadness and hopelessness. Post hysterectomy patients need support for both physical and psychological morbidity[21]. Their occurrences were common across all approaches to hysterectomy. Seung lee et al in a meta analysis of 1618 patients found no difference between abdominal and vaginal hysterectomy for complication rate, conversion to laparotomy, duration of hospitalisation and recuperation rate. Although operative time and 24h pain score was lower for vaginal hysterectomy over other approaches to hysterectomy[17].Inspite of obvious benefits of minimally invasive laparoscopic technique majority of hysterectomies are still being performed by other options. This trend is mostly due lack of adequate training, skill, availability of trained man power and non availability of equipment with disposables[30]. This trend is seen both in developed and resource poor countries like ours. Across all resource setting over time with improvement in learning curve and instrumentation there is gradual shift towards laparoscopic approach to hysterectomy[22].

V. Conclusion

Shared decision making is essential for holistic cure of any ailment. Numerous factors affect the decision making about the approach of hysterectomy.

Laparotomy for hysterectomy remains the commonest approach. Ease and acquaintanence of the procedure remains the commonest reason for this approach. Vaginal hysterectomy for parous women without coexistent adnexal pathology remains popular choice for this subset of population. With improvement in skills along the learning curve laparoscopic hysterectomy is more widely being used for hysterectomy.

S No	Legend	Number of patients (n=256)
1	Abdominal Hysterectomy	113 (44%)
2	NDVH	81 (31%)
3	Laparoscopic Hysterectomy	62 (25%)

S No	**Age (yrs)**	Abdominal Hysterectomy	NDVH	LAP Hysterectomy	
1	30-35	5	1	1	
2	35-40	12	22	16	
3	40-45	56 49%	26 32%	21 33%	
4	45-50	29	19	11	
5	50 +	11	13	13	
		113	**81**	**62**	
BMI					
1	Below 24	26	32	39	
2	Above 24	87 76%	49 60%	23 46%	
Parity					
1	Nulligravida	1	-	-	
2	P2 and below	79	38	19	
3	P3 and above	33	43	43	
Size of uterus					
1	Less than 250g	53 48%	63 79%	39 64%	
2	250-500g	36 31%	15 18%	19 30%	
3	500g +	24 21%	3 3%	4 6%	
Indication					
1	Fibroids	69 61%	39 48%	29 46%	
2	AUB	19	23	15	
3	Endometriosis	16	11	9	
4	Others	9	8	9	

BSO		19 16%	2 2%	5 8%	ANOVA Value-52.14;p≤0.001
H/O Prev Surgery		31 27%	9 11%	3 4%	ANOVA Value-27.07;p≤0.001
Duration surgery (min)		63	53	118	ANOVA Value-23.49;p≤0.001
Uni/Bilateral Salpingectomy		79 69%	11 13%	27 43%	
Uni/Bilateral oophorectomy		11 9%	3 3%	4 6%	
Duration of Hospitalisation					
1	Less than 3 days	71 63%	57 71%	51 82%	
2	More than 3 days	42	24	11	
Complications					
1	Blood Transfusion	9 7%	3 3%	5 8%	ANOVA Value 11.3;p≤0.001
2	Injury adjacent organs	5 4%	-	2 3%	
3	Wound infection	13	2	3	ANOVA Value 116.8;p≤0.001
4	Conversion to laparotomy	na	2 2%	12 19%	
5	Fever	5%	0.5%	2%	
6	Psychological Upset	5%	3%	4%	

Table 1: Results

Table 2:Uterus conserving Treatment options

S No	Modality of treatment	Number of patients	Hysterectomy (One year follow up)
1	Hormonal Pills	59	21
2	Capillary Hemostats	97	43
3	LNG IUS	49	21
4	Hysteroscopic Resection	5	1
5	Laparoscopic Myomectomy	9	-
6	Gonadotropin Agonists	13	3
7	UAE	5	-
8	NSAIDS	99	61

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DECLARATIONS

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