A Comparative Study Of Surgical Outcome In Different Approaches For Hysterectomy

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ABSTRACT

Introduction: -Globally, hysterectomy has been the commonest gynecologic surgery since a long time. One of the most remarkable innovations in surgery has been the changeover from laparotomy to laparoscopy. The first reported laparoscopic hysterectomy was in 1989 by Harry Reich, for endometriosis. As laparoscopic procedure has various important advantages over laparotomy, it has become a preferred surgical method. But open hysterectomy or laparoscopic hysterectomy has been chosen based on various factors and the surgeon's experience and skill. Earlier hysterectomies were done in conventional way at Kathmandu University Hospital. But Laparoscopic assisted vaginal hysterectomy and total laparoscopic hysterectomy were started from 2011 and 2015 respectively. **Method:** This retrospective study was undertaken to compare the demographic parameters, operative particulars, postoperative outcomes including complications of different hysterectomy approaches done from 2011 to 2018 at Kathmandu University Hospital. **Result:**A total of 756 hysterectomy cases with 461 of open hysterectomy and 295 of laparoscopic hysterectomy were done in over 8 years. There was no significant difference in mean age of patients who underwent different types of hysterectomies (46.29±6.50 and 45.52±8.15 years, p=0.6829). There was significant increase in Brahmin/Chhetri caste seeking laparoscopic hysterectomy (p=0.0001) and significant decrease in other janajati caste undergoing laparoscopic hysterectomy (p=0.0004). The indications of different type of hysterectomy were almost comparable; with fibroids/adenomyosis (49.7%) followed by abnormal uterine bleeding (19.7%) were common indications. Laparoscopic hysterectomies have significantly increased since 2016. There were significant differences in operating time, blood loss and hospital stay between open and laparoscopic hysterectomy cases with 143.63±43.25 vs 67.56±25.75 minutes**,** 294.78±51.37 vs 470.24±102.99 ml and 2.61±0.66 vs 5.64±0.69 days respectively (all p<0.0001). There were 30 major complications in open and 10 in laparoscopic hysterectomy respectively with 9 minor complications in both. Eleven laparoscopy cases (3.7%) had to be converted to laparotomy. **Conclusions:** Laparoscopic hysterectomies are possible with equivalent advantages. A good laparoscopic experiences for surgeons and a careful selection of the cases are the obligatory prerequisites.

Keywords: *Conversion, Fibroids, Hysterectomy, Laparoscopy Hysterectomy (LH), Laparoscopy Assisted Vaginal Hysterectomy(LAVH), Total Abdominal Hysterectomy(TAH)*

INTRODUCTION

Globally, hysterectomy has been the commonest gynecologic surgery worldwide since long time[1]. The aspiration for minimal invasive surgery and the capacity of surgeons to update surgical skills has contributed to the significant recent developments in laparoscopic surgery[2].

One of the most remarkable innovations in surgery has been the changeover from laparotomy to laparoscopy. The first reported laparoscopic hysterectomy was in 1989 by Harry Reich, for endometriosis. Since then, laparocopic hysterectomy has been considered as an alternative to abdominal hysterectomy[3]. Laparoscopic procedure have various important advantages over laparotomy, hence it has become preferred surgical method[4,5].

Total abdominal hysterectomy (TAH) or laparoscopic hysterectomy has been chosen based on various factors and the surgeon's experience and skill. However, laparoscopic hysterectomy has a longer learning curve, takes longer to perform and has been known to have a higher complication rate than abdominal hysterectomy, particularly in initial period[6].

In Dhulikhel Hospital (DH), also known as Kathmandu University Hospital (KUH), gynecological surgeries including hysterectomies are being regularly done in conventional way till 2011. Laparoscopic assisted vaginal hysterectomy (LAVH) service started and regularly being performed since February 2011. Later total laparoscopic hysterectomy (TLH) service was

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started from June 2015.

Though, there are ample of comparative studies done in the field of hysterectomy approaches, only limited publications related to experiences of gynecological minimal invasive surgeries available from Nepal[7-10]. Earlier, there is no such comparative study done in KUH. This retrospective study aimed to compare the operative data and postoperative outcomes and complications of different hysterectomy approaches (TAH versus LAVH or TLH) for benign gynecological conditions in women at KUH.

METHOD

This retrospective (comparative) study of the different hysterectomy approaches (TAH vs LAVH or TLH) done in women who underwent these surgeries between 2011 and 2018 in DH. This study was carried out in Department of Obstetrics and Gynaecology reviewing all the OPD/inpatient and Operation Theater (OT) records (including electronic).

For analysis purpose, TAH and staging laparotomy were considered as open hysterectomy (OH) and LAVH and TLH were considered as laparoscopic hysterectomy (LH) in the study.

Ethical clearance was taken from the hospital research committee (IRC-KUSMS#39/19). All data were entered in excel sheet and analyzed by SPSS 16 packages using appropriate statistical tools like frequency, percentage, means, p value, Chi square test.

RESULTS

Operative procedures	Age (mean±SD) in years	P value (95% confidence interval)	Remarks
Laparoscopic hysterectomy (n=295)	46.29±6.50	0.6829 (-1.3359 to 0.9759)	
Open hysterectomy (n=461)	45.52±8.15		
LAVH (n=190)	46.41±6.56	0.4891 (-1.0316 to 2.1516)	P values of lap to open conversion with LAVH and TLH are 0.4448 and 0.2962 respectively (not significant)
TLH (94)	45.85±6.10		
Lap to open conversion (n=11)	48.00±8.90		
TAH (n=413)	44.77±7.08	**0.0001** (-9.5638 to -4.8562)	
Staging laparotomy (n=48)	51.98±12.77		

Table I: Mean ages of different hysterectomy cases

There was no significant difference in mean ages of different groups except that between TAH and staging laparotomy group (Table I).

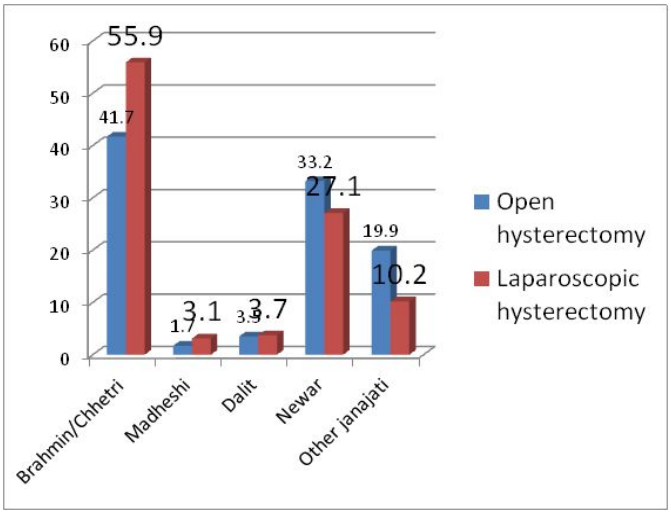

Figure 1: Caste distribution of hysterectomy cases (open and laparoscopic)

There was significant increase in Brahmin/Chhetri caste seeking laparoscopic hysterectomy (p=0.0001) and significant decrease in other janajati caste undergoing laparoscopic hysterectomy (p=0.0004). There is not much difference in patients coming for open or laparoscopic hysterectomy from different parts of Nepal. Patients undergoing laparoscopic hysterectomy or open hysterectomy from Kavre, neighbouring districts (Sindhupalchowk Dolakha Ramechhap Sindhuli), Kathmandu valley and other districts were 144 (48.8%) and 242(52.5%), 36(12.2%) and 66(14.3%), 87(29.5%) and 124(26.9%); 28(9.5%) and 29(6.3%) respectively.

Indication	Operation	Present	Absent	P value
Fibroids/ Adenomyosis	Laparoscopic hysterectomy (n=295)	137	158	0.1472 (not significant)
	Open hysterectomy (n=461)	239	222	
Abnormal Uterine Bleeding (AUB)	Laparoscopic hysterectomy (n=295)	79	216	<0.0001
	Open hysterectomy (n=461)	70	391	
Ovarian lesions	Laparoscopic hysterectomy (n=295)	13	272	<0.0001
	Open hysterectomy (n=461)	93	369	
Cervical lesions	Laparoscopic hysterectomy (n=295)	31	264	0.0644 (not

	Open hysterectomy (n=461)	31	430	significant)
Chronic pelvic pain/ Endometriosis	Laparoscopic hysterectomy (n=295)	17	278	0.0165
	Open hysterectomy (n=461)	11	450	
Polyp (cervical/endo metrial)	Laparoscopic hysterectomy (n=295)	10	285	0.1455 (not significant)
	Open hysterectomy (n=461)	8	453	
Miscellaneous	Laparoscopic hysterectomy (n=295)	8	287	0.4920 (not significant)
	Open hysterectomy (n=461)	9	452	

Table II: Indications of hysterectomy (open and laparoscopic)

The indications of different type of hysterectomy were almost comparable (Table II). But there was significant difference in operation (OT) duration, blood loss and hospital stays between those underwent open and laparoscopic hysterectomy (Table III).

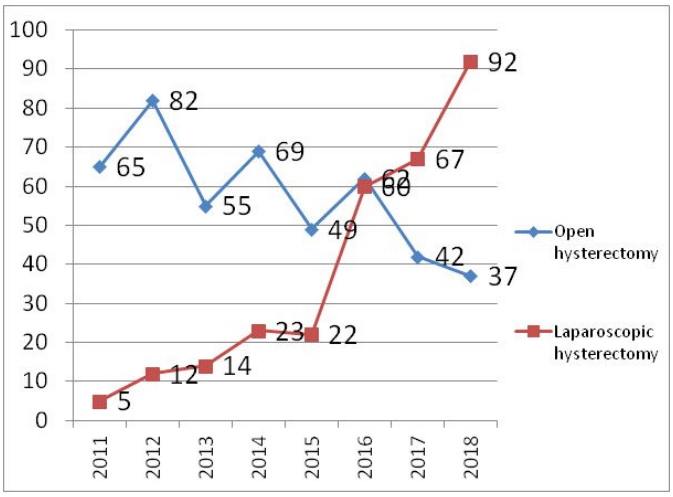

Figure 2: Trend of hysterectomy cases (open and laparoscopic)

Laparoscopic hysterectomy cases were gradually going up in comparison to open hysterectomy cases, significantly from 2016 (Figure 2). Different complications (major and minor) and laparoscopy conversion to laparotomy showed in Table IV.

Operative procedures	**OT duration (mean±SD) in minutes**	**P value (95% confidence interval)**
La paroscopic hysterectomy (n=295)	143.63±43.25	**<0.0001** (-81.0027 to -71.1373)
Open hysterectomy (n=461)	67.56±25.75	
	Blood loss (mean±SD) in ml	
Laparoscopic hysterectomy (n=295)	294.78±51.37	**<0.0001** (162.7738 to 188.1462)
Open hysterectomy (n=461)	470.24±102.99	
	Hospital stay (mean±SD) in days	
Laparoscopic hysterectomy (n=295)	2.61±0.66	**<0.0001** (2.9306 to 3.1294)
Open hysterectomy (n=461)	5.64±0.69	

Table III: Differences in OT duration, blood loss and hospital stays

Complications	**Open hysterectomy (n=461)**	**Laparoscopic hysterectomy (n=295)**
Major		
Bladder injury	1	-
Ureteral injury	1	2
Bowel injury	2	-
Vesicovaginal fistula	-	1
Major vessel injury	-	-
Vaginal cuff dehiscence	-	-
Burst abdomen	3	-
Blood transfusion	23 (maximum 3 pints)	7 (maximum 2 pints)
Minor		
Vault bleeding	2	3
Wound infection	7	-
Trocar hernia	-	-
Cautry burn	-	3
Subcuteneous haematoma	-	3
Total complication	39	19
Number of conversion to laparotomy	-	11

Table IV: Complications occurred during hysterectomy

DISCUSSION

One of the most remarkable innovations in surgery has been the changeover from laparotomy to laparoscopy. The first reported laparoscopic hysterectomy was in 1989 by Harry Reich, for endometriosis. Since then, laparoscopic hysterectomy has been considered as an alternative to abdominal hysterectomy[3]. The aspiration for minimal invasive

surgery and the capacity of surgeons to update surgical skills has contributed to the significant recent developments in laparoscopic surgery[2].

Beside mean age, caste and address of the patients (Table I and Figure 1), indications of different hysterectomy in DH are almost comparable (Table II) except that of Brahmin/Chhetri and other janajati caste; and AUB and ovarian lesions.

In this study, mean age of the patients underwent OH and LH were 45.52±8.15 and 46.29±6.5 years respectively (Table I). This was almost similar to study finding of Naveiro M, et al[11], in which mean age was 45.2± 5.7 years (first 75 LH), 48.3±10.2 years (second 75 LH) and 50.8±11.7 years (third 86 LH). And, in a study by Song T, et al[12] (n=100) of single-port access (SPA)-LAVH , the mean age of the patients was 45.8±5.1 years. But the mean age was comparatively high in studies by Terzi H, et al[13] and Pather S, et al[14] with 48.9 ± 5.9 years; and 59.1 (OH) and 56.2 (LH) respectively.

The most common indications of hysterectomy were fibroid/adenomyosis followed by AUB[15]. This was similar to study by Harkki Siren P, et al[16] in which indications for laparoscopic hysterectomy were uterine fibroids (64%) and menorrhagia (20%). Kim SM, et al[2] showed the indications of TAH and multi-port access (MPA)-TLH were myoma 162 (57%) and 224 (61.2%) followed by adenomyosis 61 (21.5%) and 55 (15%) respectively. Additional 40(14.1%) and 49(13.4%) were myoma with adenomyosis.

In a study by Song T, et al[12], pathologic diagnoses at hysterectomy included myoma (48%), myoma combined with adenomyosis (23%), adenomyosis (21%), endometrial hyperplasia (4%), and cervical carcinoma in situ (3%), and chronic pelvic pain combined with endometriosis (1%).Likewise Terzi H, et al[13] shared the indications TLH were AUB 89 (34.6%), myoma uteri 65(25.3%) and AUB and myomauteri 48(18.7%).

Indications of hysterectomy were also similar in this study. Fibroids 46.4% and 51.8% followed by AUB 26.8% and 15.2% in LH and OH respectively (Table II). Terzi H, et al[13] showed prolpsus uteri 4 (1.6%) was the one of the indications. In our study five LH and one OH were done for prolapsed uterus. Likwise Kim SM, et al[2] showed CIN 2,3 were indications for TAH and MPA-TLH were 11 (3.9%) and 16 (4.4%) respectively. In this study 13 LH and 20 OH were done for CIN2, 3 and beyond.

Average operation duration of OH and LH were 67.56±25.75 minutes and 143.63±43.25 years respectively in this study (Table III). This was similar to study finding of Agarwal P, et al[15] and exactly same to study finding of Garett AJ, et al[17]. The average time required in TLH in the first year after starting surgery was 147.37 min compared to 84.84 min in TAH[15]. Mean operating time was 143.1 ± 40.4 minutes[17]. The operating time was shorter in the studies by Terzi H, et al[13], Harkki Siren P, et al[16] and Song T, et al[12] with 70.4 ± 15.4 minutes, 109±45 minutes and 115.7±40.3 minutes respectively. And the operation time was longer in the studies by Kim SM, et al[2] and Pather S, et al[14]. Total operative time was 176.4±47.9 minutes in TAH and 149.3±59.5 minutes in MPA-TLH[2]. Mean operation time was 226 minutes in first 25 TLH cases, 200 minutes in last 25 TLH cases and 175.5 minutes in OH[14].

Average intraoperative blood loss was significantly lower in TLH as opposed to TAH. Amout of blood loss was 411.82±70.10 ml (TAH) and 145.12±29.51 ml (TLH)[15]. Kim SM, et al[2] found the estimated blood loss 427.1 ± 250.6 ml in TAH and 163.8 ± 168.9 ml in MPA-TLH. In this study average blood loss was 470.24±102.99 ml (OH) and 294.78±51.37 ml (LH) (Table III). Mean estimated blood loss was 307.6 ± 246.3 ml[17]. That was 250-215 ml[16].

While we prefer laparoscopic to conventional (open) gynecological surgeries, we are anxious about its complications. In this study the conversion to laparotomy was 3.7% (11 out of 295 LH cases) (Table IV). The reasons for conversion were big myoma (6), dermoid cysts (2), grade IV endometriosis (2) and adenomyosis (1).

Conversion to an open laparotomy was needed in one percent[12]. Total conversion rate was 2.9%[18]. Seventeen cases from the MPA-TLH group (n = 366) required unplanned intra-operative laparotomy conversion[2].Total rate of conversion to laparotomy was 9.6 % (12 out of 125)[15]. Eight of 120 patients (6.6%) required conversion to laparotomy[17]. Conversion to laparotomy was 9(12.0%) in first 75 LH, 9(12.0%) in second 75 LH and 1(1%) in third 86 LH, showing gradual decrease in conversion rate[11]. Conversion to laparotomy generally occurred more frequently in the early learning phase[19].

In the literature, the rates varied for conversion from laparoscopy to laparotomy, from 6.6% to 0.03%[17,19-21]. The complications were related to advanced disease and broad adhesions rather than due to laparoscopy, itself. Our rate of conversion to laparotomy was 1.9%[13].

In this study average duration of hospital stay was 5.64±0.69 days and 2.61±0.66 days in OH and LH group respectively (Table III). The average durations of hospital stay in TAH group were 5.68±3.10 days and 3.58±1.97 days in TLH[15].

The mean hospital stay was 1.3±0.5 days[16]. That was 2.4 ± 1.4 days (entire TLH group)[17]. Naveiro M, et al[11] shared their hospital stay findings with 4.0± 3.1days, 2.9±1.2 days and 2.5±1.6 days in first 75 LH, second 75 LH and third 86 LH respectively. Kim SM, et al[2] found hospital stay 7.0±2.1 days in

TAH and 5.5±2.0 days in MPA-TLH group.

Mean length of stay was 2.62 days in first 25 TLH cases, 1.82 days in last 25 TLH cases and 3.38 days in OH[14]. The median postoperative hospital stay was 3 days (range 3–7 days)[12] . And stay in hospital was 3.4±1.2 days[13].

The total complication rate was 6.2%. Complications were classified as major (3.1%) and minor (3.1%)[13]. Driessen S, et al[18] experienced complications of 4.7%. Incidence of major complications in TLH was 1.6 % (2 in 125) compared to 4 % (5 in 125) in TAH group. Incidence of minor complications in TLH group was 7.1 % (9 out of 125) compared to 9.7 % in TAH group (12 out of 125). Incidence was 14 % (3 out of 22) in the first year[15]. Kim SM, et al[2] faced overall 15 complications (5.3%) in TAH compared to 32(8.7%) in MPA-TLH group. Kim

We experienced 39(8.5%) complications in OH and 19(6.4%) in LH group (Table IV). Naveiro M, et al[11] found overall complications 18 (24%) in first 75 LH, 7 (9.3%) in second 75 LH and 7 (8.1%) in third 86 LH cases.

Terzi H, et al[13] showed the need for blood transfusion in 11 (4.3%). We found blood transfusion in 23 (5.0%) in OH and 7 (2.4%) in LH group.

CONCLUSION

We compared the postoperative outcomes and complications of different hysterectomy approaches in the field of gynaecological surgeries.Laparoscopic hysterectomies are possible with equivalent advantages while managing gynecological lesions as well. Thorough laparoscopic experiences of surgeons and careful selection of the cases are the obligatory prerequisites.

CONFLICTS OF INTEREST

Author declares that there is no financial support or relationships that may pose potential conflicts of interest.

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