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Original Research Article

A comparative study between total laparoscopic hysterectomy and total abdominal hysterectomy for benign uterine conditions

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ABSTRACT

Background: The aim of this prospective study is to evaluate and compare the results of two routes of hysterectomy for benign uterine conditions of less than 14 weeks who performed in our tertiary centre.
Methods: This was a prospective interventional single centre study on 140 consecutive patients (70 patients in each group) who underwent hysterectomy for benign uterine conditions either by total laparoscopic hysterectomy (TLH) or by total abdominal hysterectomy (TAH) route.
Results: There were no statistical differences between two groups regarding age, parity, previous history of abdominal surgery, demographic factors, For TLH group vs. TAH group- operative time was (89.34±12.3 minutes) vs. (46.6±5.92 minutes) ($p<0.0001$), blood loss (19.61±2.34 ml) vs. (124.8±17.29 ml) ($p<0.0001$), post operative haemoglobin drop (0.34±0.15 gm/dl) vs. (1.36±0.24 gm/dl) ($p<0.0001$), pain score (2.56±0.97) vs. (5.31±1.02) ($p<0.0001$), mean ambulation time (15.16 ±4.64 hours) vs. (48.76±5.08 hours) ($p<0.0001$), mean time to catheter removal (12.47±0.94 hours) vs. (48.23±0.64 hours) ($p<0.0001$), hospital stay (3.74±0.50 days) vs. (7.64±0.98 days) ($p<0.0001$), resumption to normal daily activities (4.39±0.2 weeks) vs. (11.8±1.77 weeks) ($p<0.0001$), were significantly lower and earlier in TLH group as compared to TAH group, also compared intra-operative and post-op complication (less in TLH group) and patient satisfaction score(better in TLH group).
Conclusions: TLH route is safe and feasible as compare to TAH route and found to have, less amount of blood loss, fewer complications and early ambulation, recovery and discharge.

Keywords: TLH, TAH, Benign uterine conditions

INTRODUCTION

Hysterectomy is one of the most common surgical-procedure perform for benign uterine pathologies and can be done via abdominal, vaginal and laparoscopic routes.[1] It is the second most frequently performed major surgical procedure on the women next only to the caesarean section.[2]

Most common reasons for performing hysterectomies are fibroids, bleeding irregularities, endometrial hyperplasia, cervical dysplasia, endometriosis and genital prolapse and malignancy.[3]

The optimal route of a hysterectomy for a patient will depend on the nature of the pathology, uterine size, uterine descent, the likelihood of pelvic and bowel adhesions (due to endometriosis or previous pelvic surgery), presence of adnexal mass, the surgeon‘s preference skill and experience, availability of facility, patient preference after counselling about both procedures.[4]

TLH is an upcoming minimally invasive procedure as compared with TAH, women undergoing TLH have a low intraoperative blood loss, less postoperative haemoglobin drop, lower percentage of wound infection, less post-operative pain, early catheter removal, early ambulation, quicker return to normal physical activity, cosmetically

looks better, more post-operative satisfaction and better quality of life due to small abdominal incision in TLH surgery.[4-6,9] But because necessity of comprehensive surgical education and equipment today still a lot of gynaecologists prefer abdominal surgery.[21] However complication in laparoscopic procedure depends on surgical experience according to previous studies.[8]

The purpose of this study was to compared the feasibility and safety of TLH and TAH procedure in the treatment of benign uterine diseases. The aim of this study was to compare the two different routes of hysterectomy and find out the most efficient route of hysterectomy in women with mobile non-prolapsed uteri up to 14 weeks size by comparing parameters mentioned below in objective.

The comparison included-Operating time, Intraoperative blood loss, intra and post-operative complications, post-operative pain, post operative haemoglobin drop, blood transfusion requirement post operatively due to haemoglobin drop, wound infection, ambulation time, catheter removal time, hospital stay, time for resumption to normal physical activities (recovery time), patient's satisfaction score.

METHODS

Study design and setting

This prospective interventional group study was conducted in department of obstetrics and gynaecology, SMS medical college and attached group of hospitals, Jaipur, Rajasthan.140 patients requiring hysterectomy for benign uterine conditions admitted to the gynaecology ward fulfilling all inclusion and exclusion criteria would be included from May 2019 to November 2020. This study included Patients having benign uterine conditions (diagnosed by D and C, Pap smear, Cervical biopsy and USG) with non-descended uterus admitted for hysterectomy, who gave consent for the study, Uterine size <14 weeks mobile uterus, prior one LSCS (lower segment caesarean section) with above conditions. Patient with Complex adnexal mass and previous two LSCS and previous myomectomy were excluded.

Methodology

In this study, patients admitted for hysterectomy were evaluated after written informed consent. Pre-anaesthetic check-up done in view of fitness for surgery by anaesthetist, All the procedures were done by single surgeon. Time of surgery was measured from the start of incision to end of the procedure. Weight of swab in the dry and blood-soaked states was measured. Considered 19 mg weight was equal to 1 ml blood loss. In laparoscopic surgery blood loss was measured by (volume in suction bottle-volume of irrigation fluid). Post operatively temperature charted 4 hourly, defining febrile morbidity as 38o C on two occasions 4 hours apart, excluding the first post-operative day. After this, patients routinely received injectable analgesics for 2 days thrice a day. After this, on day 3 of surgery patients were given oral/injectable analgesics on request and the total number of days of analgesics requirement were noted. Post-operative pain was measured according to visual analogue scale (10 points). Intraoperative blood loss and visceral injuries, postoperative haemoglobin drop, blood transfusion requirement, mobility, recovery time, febrile morbidity, infections, ambulation time, hospital stay, conversion to abdominal route, re-laparotomy were recorded. Patient satisfaction was scored on the basis of Likert scale, when patient come for follow up on day 30 of surgery asked to fill a patient satisfaction questionnaire (which included govt. cost of lap surgery, pain relief, cosmetic, duration of hospital stay, recovery time and any other complications.

Statistical analyses

Data was coded and recorded in MS excel spread sheet program. All statistical analysis was done using EPI info version 7.2.1.0 statistical software. Categorical variables were expressed as frequency and percentage and were analysed using chi-square/ Fischer's exact test as applicable. Continuous variables were expressed as mean and standard deviation and were analysed using independent sample t test for comparison between two groups. Mann Whitney test was used for ordinal variables. For comparison between more than two groups one way ANOVA test was used. P>0.05 statistically significant.

RESULTS

mean age of subjects in TLH is 44.15 and in TAH is 46.13 years, no significant difference was seen in both groups for mean age (p>0.08), locality-rural and urban (p=0.310), religion-Hindu, Muslim (p>0.05), no statistical difference was found for residence and religion. In TLH group, 41 (58.6%) were illiterate and 29 (41.4%) were literate while in TAH group, 50 (71.4%) of subjects were illiterate and only 20 (28.6%) were literate, difference was also however not found to be statistically significant (p=0.156), according to socioeconomic status (p>0.05) no statistical difference was found. Comparison according to parity between two groups, parity 3 and more have in TLH 38.51% patients and in TAH 35.71% patients, which was also not significant (p=0.256). History of previous surgery was observed 38.51% in TLH group and 35.71% in TAH group which was not significant (p>0.05) (Table 1).

Table 1: Subjects' characteristics.

Subjects' characteristics	TLH, n (%)	TAH, (%)	P value
Age (In years) (Mean ±SD)	44.15±6.14	46.13±7.42	0.088 NS
Parity 3 More	49 (70)	53 (75.71)	0.256 NS

Continued.

Subjects' characteristics		TLH, n (%)	TAH, n (%)	P value
Previous history of abdominal surgery		27 (38.51)	25 (35.71)	≥0.05 NS
Residence	Rural	31 (44.3)	38 (54.3)	0.310 NS
	Urban	39 (55.7)	32 (45.7)	
Religion	Hindu	53 (75.1)	61 (87.1)	0.128NS
	Muslim	17 (24.3)	9 (12.9)	
Literacy status	Illiterate	41 (58.6)	50 (71.4)	0.156 NS
	Literate	29 (41.4)	20 (28.6)	
Socioeconomic status	Lower	8 (11.4)	17 (24.3)	0.132 NS
	Middle	55 (78.6)	48 (68.6)	
	Upper	7 (10)	5 (7)	

Operative indications (PALM-COEIN:-poly(P), adenomyosis (A), leiomyoma (L), malignancy (M), coagulopathy (C), ovulatory dysfunction (O), endometrial (E), iatrogenic (I) and not yet classified(N))were showed in both groups, not statistically significant, most common indication was leiomyoma Figure 1.

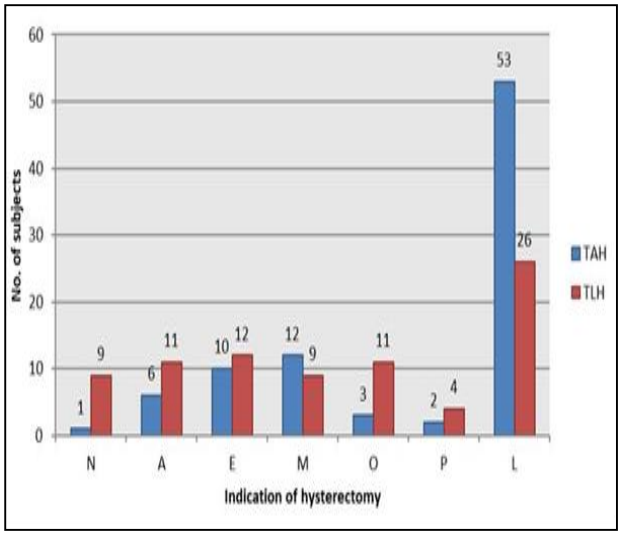

Figure 1: Distribution of subjects in relation to indication of hysterectomy.

Table 2: Intraoperative parameters and complications.

Intraoperative parameters (mean ± SD)	TLH	TAH	P value
Mean operative time (mint)	89.34± 12.3	46.6± 5.92	<0.0001
Mean blood loss (ml)	35.21± 19.61	138.4± 58.6	<0.0001
Intraoperative complications	Nil	Nil	Nil

Mean operative time in TLH was (89.34±12.3) minutes with a range of 60-120 minutes, while in TAH group was (46.6±5.92) minutes with a range of 30-60 minutes. The mean operative time was significantly more in TLH group as compared to TAH group (p<0.0001). Mean blood loss in TLH the mean blood loss was (19.61±2.34) ml with a range of 10-135 ml, while in TAH group was (124.8±17.29) ml with a range of 90-160 ml. This difference was found to be statistically significant i.e. The mean blood loss was significantly less in TLH group as compared to TAH group (p<0.0001). In our study no significant difference was found in both groups for any intra-operative complications because no intra-operative complication was found during study time (Table 2).

Mean pain score in TLH was (2.56±0.97) and the median pain score was 2 with a range of 1-5 and in TAH group mean pain score was (5.31±1.02) and the median pain score was 5 with a range of 4-8. This difference was found to be statistically significant i.e. The median pain score was significantly less in TLH group as compared to TAH group (p<0.0001).

The mean haemoglobin drops in TLH the mean haemoglobin drop was (0.34±0.15 gm/dl), with a range of 0.1-0.7 gm/dl, while in TAH group was (1.36±0.24 gm/dl), with a range of 0.8-1.8 gm/dl. This difference was found to be statistically significant i.e. The mean haemoglobin drop after surgery was significantly less in TLH group as compared to TAH group (p<0.0001), but not significant for blood transfusion in post operative period in both groups (blood transfusion done before surgery in whose patients in which haemoglobin was low, not fit for surgery and during surgery blood loss not significant which required blood transfusion).

Mean time to catheter removal in TLH group was (12.47±0.94 hours) with a range of 12-16 hours, while in TAH group was (48.23±0.64 hours), with a range of 48-50 hours. This difference was found to be statistically significant (p<0.0001). The mean time to catheter removal after surgery was significantly earlier in TLH group as compared to TAH group.

Mean time to ambulation in TLH group was (15.16±4.64 hours) with a range of 12-50 hours, while in TAH group was (48.76±5.08 hrs), with a range of 32-56 hrs. This difference found to be statistically significant (p<0.0001). Mean time to ambulation after surgery was significantly earlier in TLH group as compared to TAH group.

Mean duration of hospital stay in TLH was (3.74±0.50 days) with a range of 3-5 days, while in TAH group was

(7.64±0.98 days), with range of 6-11 days. This difference was found to be statistically significant (p<0.0001). Mean duration of hospital stay after surgery was significantly less in TLH group as compared to TAH group.

Mean time to resumption of normal physical activities in TLH was (4.39±0.2 weeks) with a range of 3-10 weeks, while in TAH group was (11.8±1.77 weeks), with a range of 9-15 weeks. This difference was found to be statistically significant (p<0.0001). Mean time to resumption of normal physical activities after surgery was significantly less in TLH group as compared to TAH group (Table 3).

Table 3: Post operative parameters.

Post operative parameters (Mean ± SD)	TLH	TAH	P value
Pain score (according to vas scale)	2.56± 0.97	5.31± 1.02	<0.0001 (S)
Mean Hb drop (gm/dl)	0.34± 0.15	1.36± 0.24	<0.0001 (S)
Catheter removal time (hours)	12.47± 0.94	48.23± 0.64	<0.0001 (S)
Ambulation time (hours)	15.16± 4.64	48.76± 5.08	<0.0001 (S)
Hospital stays (days)	3.74± 0.50	7.64± 0.98	<0.0001 (S)
Resumption to normal physical activities (weeks)	4.39± 0.2	11.8± 1.77	<0.0001 (S)

Post op complications were seen in only 7 (10%) of subjects in TLH group and 25 (35.7%) subjects in TAH group. This difference found to be statistically significant (p<0.05). i.e., post op complications were more common in TAH group as compared to TLH group Figure 2.

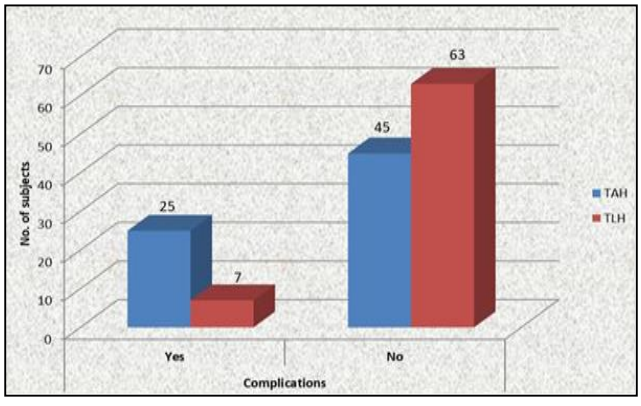

Figure 2: Distribution of subjects in relation to post operative complications.

Abdominal wound infection was more common in TLH group (0%) as compared to TAH group (10%) and this difference found to be statistically significant (p<0.05). Similarly, fever was also more common in TAH group (17.1%) as compared to TLH group (4.3%) and this difference found to be statistically significant (p<0.05).

Other complications like paralytic ileus, systemic infection, urinary complaint and vaginal discharge were also more common in TAH group as compared to TLH group, the difference was however not found to be statistically significant (p>0.05) (Table 4).

Table 4: Frequency of various post op complications among study groups.

Complications	TAH		TLH		P value
	N	%	N	%	
Abdominal wound infection	7	10	0	0	0.020 (S)
Paralytic ileus	7	10	1	1.4	0.069 (NS)
Systemic infection	5	7.1	1	1.4	0.211 (NS)
Fever	12	17.1	3	4.3	0.029 (S)
Urinary complaint	2	2.9	0	0	0.746 (NS)
Vaginal discharge	3	4.3	1	1.4	0.268 (NS)
Port site serous discharge	0	0	1	14	1.000 (NS)

In TLH group, 62 (88.6%) of the subjects were strongly satisfied and 8 (11.4%) were satisfied, while in TAH group, most of the patient were dissatisfied (55.7%) and only 27 (38.6%) were satisfied. This difference in the patient satisfaction between 2 groups was statistically significant (p<0.001) according to Likert scale (Table 5).

Table 5: Distribution of study subjects in relation to patient satisfaction score.

Patient satisfaction	TAH		TLH		Total	
	N	%	N	%	N	%
Dissatisfied	39	55.7	0	0.0	39	27.9
Neutral	3	4.3	0	0.0	3	2.1
Satisfied	27	38.6	8	11.4	35	25
Strongly satisfied	1	1.4	62	88.6	63	45
Total	70	100	70	100	140	100

DISCUSSION

Hysterectomy is common surgical procedure done by gynaecologists. Hysterectomy for benign uterine conditions can be done by abdominal, vaginal and laparoscopic routes1. Each route has own merits and demerits. This study was done to compared the two different routes of hysterectomy TLH and TAH and find out the most efficient route with non-prolapsed uteri up to 14 weeks size by comparing various parameters.

Mean age of patients in our study was 44.15 and 46.13 years for TLH and TAH group respectively. Mostly patients in both groups were between age of (40-49) years. Most of the patients had parity 3 and more in both groups, 49 (70%) and 53 (75.71%) in TLH and TAH group respectively. There was no statistical significance found in both groups for age and parity.[1,5,8,22,27,30,31] In our study patient's demographic factors (religion, residence, literacy and SES) were also compared between the two groups, no statistical difference was found ($p>0.05$).[6,14,30] In TLH group (38.51%) and in TAH group (35.71%) showed previous history of surgery which is almost equal in both group but no impact was seen on route of surgery with respect to all comparable factor due to previous history of surgery.

In our study, subjects distributed according to indication of surgery (PALM-COIEN) included fibroid uterus, adenomyosis, pelvic inflammatory disease, endometrial hyperplasia, endometrial polyps, chronic cervical and pyrometers among which fibroid was the most common indication in both the groups (TAH>TLH) and these were comparable in both the groups, no statistical significance was found.[1,5,21,26]

In our study mean operative time for TLH group was 89.34 minutes compared to 46.6 minutes in TAH group, this difference was statistically significant. Operative time more in TLH group then TAH group. Similar results were observed in various studies.[1,5,8,16,20,29] Operative time can be less in TLH group depends on surgeons experience and expertness in skill of surgery and assistance of the man power.

Mean blood loss in our study was (35.21±19.61 ml) for TLH group, this because of advent of electrocoagulation system compared to (138.4+58.6 ml) for TAH group and it was statistically significant. This observation was similar to previous studies.[5,7,15,24] In our study, no intraoperative complications were noted in both TLH and TAH group.[1,5,9,14,22] No patient in TLH group, required to conversion to abdominal hysterectomy.

In our study pain score on visual analogue scale was significantly less in TLH group (2.56±0.97) compared to TAH group (5.31±1.02). This observation is supported by previous studies which also showed less post- operative pain and requirement of analgesics in TLH groups compared to TAH.[6,9,13,24]

In our study mean haemoglobin drop for TLH group was (0.34±0.15 gm/dl) that was significantly less than the TAH group which was (1.45±0.45 gm/dl). This association was statistically significant ($p<0.0001$).[1,23] But there was no statistically significant difference in requirement of blood transfusion post-operatively due to Hb drop.[14,19,21,27]

In our study subjects also compared for catheter removal time less in TLH group (12.47±0.94 hours) compared to TAH group (48.23±0.64 hours) and mean ambulation time for patients of TLH group was (15.16±4.64 hours) and for TAH groups it was (48.76±5.05 hours), this could be due to late catheter removal time in TAH group as compare to TLH group and more post-op morbidities and it was found to have statistically significant.[1,3,6,22] Time to resumption of normal physical activities which was less in TLH group (4.39±0.2 weeks) as compared to TAH group (11.8±1.77 weeks).[13] This difference was found statistically significant, which was showed early recovery in TLH group with less post-operative morbidity as compared to TAH group.[26,31]

Mean duration of hospital stay was significantly less for TLH group (7.64±0.98 days) compared to TAH group (3.74±0.50 days). This could be due to of many factors including more pain and requirement of analgesics, more patients developed post-operative febrile illness and abdominal wound infections and gap in patients with TAH group requiring prolonged hospital stay and delayed ambulation and recovery in TAH group. Similar result was found in previous studies.[1,3,5,14,17,25,31]

Most common post-operative complication in both the groups was febrile illness. Post-operative fever could be due to surgical site infection, systemic infections like UTI, Pneumonia or other systemic infections but in most of the patients no source of infection was found. Post-operative fever was significantly more in TAH group (12% of patient) compared to TLH group (3% of patients). Abdominal wound infection was documented in 7% of patients in TAH group in comparison to none of the patients in TLH group and this observation was statistically significant.[1,9,26,31] However no significant difference was found in systemic infection, urinary complaint, vaginal discharge, paralytic ileus, port site serous discharge in both the groups. This result was showed that post-operative complications more in TAH group as compare to TLH group.

In our study, patient satisfaction score compared between two groups, On the basis of questionnaires, in TLH group 62 (88.6%) of the subjects were strongly satisfied and 8 (11.4%) were satisfied, in TAH group, most of the patient were dissatisfied (55.7%) and only 27 (38.6%) were satisfied, in TLH group 62 (88.6%). This difference in the patient satisfaction score between the two groups was statistically significant. ($p<0.001$).[13]

Limitation

Our study had several limitations, first it was a single centre study at tertiary hospital and could not be correlated with general population. Second, both the surgeon and observer could not be blinded because of intervention required in the study. Third, only patients with benign uterine conditions up to 14 weeks were recruited, but as we know now TLH can be performed for large uterine size by debulking. Fourth, psycho-sexual implications of both surgeries were not compared and long-term postoperative effects were not taken into account.

CONCLUSION

TLH group had less intraoperative blood loss and complications, less post-operative pain and less requirement for analgesics, less postoperative haemoglobin drop, but has more operative time which was compensated by above mentioned benefits as compared to TAH group. TLH group had early catheter removal, early ambulation, less hospital stays as compared to TAH group. TLH group had less postoperative complications, early recovery, early resumption for daily physical activity and more satisfaction at 30th day of surgery (follow up day) on the basis of questionnaires asked to patients as compared to TAH group.

In conclusion, hysterectomy by laparoscopic route in patients with benign uterine conditions less than 14 weeks found to be safe, less invasive, efficacious and have more postoperative vitality as compared to abdominal hysterectomy. Therefore, all patients admitted for hysterectomy with moderately enlarged uterus should be operated for laparoscopic.

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