



ORIGINAL ARTICLE

**COMPARITIVE STUDY BETWEEN LAPAROSCOPIC ASSISTED VAGINAL
HYSTERECTOMY(LAVH) AND TOTAL ABDOMINAL HYSTERECTOMY(TAH)**

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ABSTRACT

Background: Hysterectomy is the second most common major surgery procedure done after cesarean section by gynecologists in many countries and the most common procedure is total abdominal hysterectomy (TAH). The incidence of laparoscopically assisted vaginal hysterectomy (LAVH) performed for benign lesions has progressively increased in recent years. Our objective was to compare the relative advantages and disadvantages of LAVH and TAH procedures. **Methods:** A clinical trial was performed on patients who were candidates for hysterectomy with benign reasons in Rajah Muthiah Medical College hospital. By simple randomization, 89 patients (30 for LAVH and 59 for TAH) were selected. Demographic details and intra-operative and post-operative complications were recorded by and were compared between the two groups.

Results.The mean age for LAVH is 44.17 ±6.59 whereas it is 42.34 ±5.09 for TAH. The more common presentation of uterine size in LAVH is 10 weeks (36.7%) and it is again 10 weeks (23.7%) for TAH. 70% of patients in LAVH have not received concomitant surgery whereas 67.8% in TAH have not received concomitant surgery. Oophorectomy is the common concomitant surgery performed for both LAVH (20%) and TAH (28.8%) groups. The common indications of surgery are fibroid (43.3% in LAVH and 62.7% in TAH). The mean operation time is 140.50±29.72 for LAVH and 120.68±40.39 for TAH which is statistically significant. The mean blood loss is higher for TAH (426.70±336.66 ml) than LAVH (213.33±102.50) which is statistically significantly. The mean pain score is 2.70±1.74 for LAVH which is comparatively less than TAH (6.93±1.28) and which is statistically significant. **Conclusion:** Although operation length is significantly higher in LAVH, this procedure is safer and more comfortable for patients and health care providers.

Keywords: blood transfusion, hemoglobin, intraoperative complications, laparoscopic assisted vaginal hysterectomy, postoperative, LAVH, total abdominal hysterectomy, TAH.

1.INTRODUCTION

Hysterectomy is the most commonly performed gynaecological procedure. By the age of 60, nearly one in three women will have undergone hysterectomy. Approximately 600,000 hysterectomies are performed in United States yearly of which 90% were done for benign conditions. (1) Studies in the US show that the most common type of hysterectomy performed is abdominal and the abdominal route is 66.1% is higher than other techniques (2). While this prevalence showed a decrease from 1997 to 2005 (3), it is still very high.

Laparoscopic hysterectomy (LH) was first performed in January by Harry Reich (4,5) in Pennsylvania and is defined

as the 'laparoscopic ligation of the major vessels supplying the uterus'. Johns and Diamond (1994) proposed staging of laparoscopic hysterectomy to indicate how much of the procedure is to be performed laparoscopically (6)

There are many surgical advantages to laparoscopy, particularly magnification of anatomy and pathology, easy access to vagina and rectum, ability to achieve complete haemostasis, safely tackle abdominal adhesions, as in case of previous pelvic surgery and remove endometriosis and complex adnexal masses at the time of vaginal hysterectomy. In addition it also allows one to combine this

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surgery with other indicated laparoscopic procedure like appendicectomy, cholecystectomy, herniorrhaphy, etc.

Laparoscopic Assisted Vaginal Hysterectomy(LAVH) has become an alternative to conventional abdominal hysterectomy and a lot more patients prefer the laparoscopic approach for cosmetic purpose-smaller incision, faster recovery time, less post operative pain(7). These advantages make these procedures more acceptable than abdominal techniques, however there is still a lot of argument about the type of hysterectomy.

This study aims to access which method results in the best clinical results and to provide evidence for decision making regarding the surgical treatment of benign diseases.

2.MATERIAL AND METHODS:

A clinical trial was carried out in Rajah Muthiah Medical College Hospital to compare LAVH and TAH in patients who were candidates for hysterectomy with benign reasons from July 2013 to September 2015. The patients enrolled for LAVH has selection criteria of uterine size not exceeding 16weeks and no major cardio-pulmonary disease or advanced gynaecological malignancy. Patients not meeting these criteria, or those opting for conventional procedure underwent total abdominal hysterectomy. All the patients undergoing Laparoscopic surgery gave informed consent including the possibility of a laparotomy being necessary for the safe completion of their surgery.

Preoperatively, patients underwent bowel preparation by taking liquid diet for 24 hrs prior to surgery. Laxative and enema were given the previous evening. All the patients received prophylactic intravenous antibiotic (cefotaxim 1gm) 30 min before surgery. General endotracheal anesthesia was routinely employed and full emergency laparotomy capability was present if required.

A video laparoscopy technique was used with a single or a three chip camera and a television monitor was placed lateral to the patient's feet. A 10mm intra-umbilical trocar was inserted after creating pneumoperitoneum. A 10mm trocar with inbuilt reduction sleeve on the operator's side and a 5mm trocar on the assistant's side were placed under direct vision, midway between symphysis pubis and umbilicus and lateral to the inferior epigastric vessels. An additional 5mm suprapubic midline trocar was placed in patients with big uteri or extensive adhesions. An intrauterine manipulator was placed for uterine mobilization during the procedure. Gas insufflation was performed using an automatic CO2 insufflator. Bipolar / unipolar cautery system was routinely used. Initial careful evaluation of the abdomen and pelvis was performed along with identification of ureters, till their entry into the base of broad ligaments. However no dissection of ureters was routinely performed to reduce operative time and minimize the risk of ureteral vascular compromise. The infundibulo-pelvic, broad and round ligaments were coagulated . If the ovaries were to be conserved, the utero-ovarian ligament was dealt with similarly. Vesico-uterine peritoneum was dissected with curved unipolar scissors and the bladder was displaced

inferiorly with blunt and sharp dissection. Next, a moist sponge on a ring forceps was placed high up in the posterior fornix and using unipolar hook/scissors, posterior fornix was entered. Anterior fornix was routinely opened vaginally. Bilateral uterine arteries were routinely dealt with via vaginal route. Remainder of the surgery was completed vaginally and vaginal cuff closed by interrupted vicryl no.1 sutures. A final inspection and irrigation of peritoneal cavity was performed to ensure complete hemostasis. The 10mm port sites had absorbable fascial sutures placed in order to minimize the risk of subsequent hernia formation.

Postoperative care included infusing IV fluids and continuous catheterization for 24 hrs. Early feeding (8-12 hrs postoperatively) was encouraged and the patients were ambulated 12-24 hrs after surgery. Postoperative pain was assessed in the 3days of surgery using visual analogue scale(VAS) from 0=no pain to 10=maximum pain. An analgesic was given the day after surgery for postoperative pain. A temperature $\geq 38^{\circ}$ C starting from the second postoperative day was considered as postoperative fever. The patients was discharged on the 5th post operative day. All the patients had a follow up office visit after one and six weeks of surgery.

Statistical evaluation: Statistical analysis is carried out using statistical packages for social sciences(SPSS-21).

3.OBSERVATIONS & RESULTS:

The age range and parity of our patients is depicted in Table 1. Mean uterine size was 10 weeks in LAVH group as compared to 14 weeks in the TAH group. The upper limit of uterine size in LAVH patients was 12 weeks and TAH 22 weeks. Those with previous history of emergency surgery for conditions like intestinal obstruction, ruptured viscera or peritonitis due to any cause were excluded from the laparoscopic surgery group. Concomitant surgery was performed in both the groups as depicted in Table 1. Surgeries like pelvic floor repair, oophorectomy, adhesiolysis was performed

Table 1: Patient Characteristics

| Patient characteristics | LAVH | TAH |
|------------------------------|------------|------------|
| No.of.Patients | 30 | 59 |
| Mean age(yrs) | 44.17±6.59 | 42.34±5.09 |
| Mean Uterine Size | 10wks | 14wks |
| Concomitant surgeries | | |
| Oophorectomy | 6(20%) | 17(28.8%) |
| Pelvic floor repair | 2(6.6%) | 1(1.7%) |
| Appendicectomy | - | 1(1.7%) |
| Adhesiolysis | 1(3.33%) | - |

The indications for performing hysterectomy were comparable in both the groups, the most common indication being fibroid uterus. Other indications were dysfunctional uterine bleeding, adenomyosis, endometriosis, adnexal masses and chronic pelvic inflammatory disease (Table 2). All specimens were routinely sent for pathological examination. Most common pathological diagnosis was myoma(s).

The mean operative time in LAVH group was 140.50(range 121-180min); In TAH group mean time taken to perform the surgery was 120.68 min (range 60-121 min) and the

difference in operative time was statistically significant ($p < 0.020$). As the operations were done in a teaching hospital allowing the residents to observe and assist the laparoscopic procedures, the operative time was prolonged to some extent.

Table 2 Primary indications for surgery

| Indications | LAVH | TAH |
|----------------------------|-----------|-----------|
| Fibroid | 13(43.3%) | 37(62.7%) |
| Adenomyosis | 3(10%) | 8(13.6%) |
| DUB | 9(30%) | 4(6.8%) |
| Adnexal mass | 1(3.3%) | 6(10.2%) |
| Endometriosis | 1(3.3%) | 1(1.7%) |
| Cervical/Endometrial polyp | 1(3.3%) | 2(3.4%) |
| PID | 2(6.7%) | - |
| CIN I | - | 1(1.7%) |

The mean blood loss during LAVH as determined by the anesthesiologist was 213.33 ± 102.50 ml vs 426.70 ± 336.66 ml in TAH (Table 3) and was significantly less in the LAVH group ($p = 0.001$). The blood loss was calculated accurately by subtracting the volume of irrigation fluid from the amount of fluid collected in suction apparatus. 4 (13.3 %) of the patients of LAVH group and 21 (35.6 %) of the patients of TAH group required blood transfusion. The median length of hospital stay after abdominal hysterectomy was five days longer than that for laparoscopic assisted vaginal hysterectomy and this was statistically significant ($p < 0.001$). Abdominal hysterectomy was significantly more painful than LAVH, the pain scores being much higher when measured 48 hrs after the procedure, thereby making the analgesia requirement higher ($p = 0.001$). On the other hand patients of LAVH had significantly higher activity scores at one and six weeks after surgery as compared to conventional abdominal procedure ($p < 0.001$).

Table 3 Results

| | LAVH | TAH |
|----------------------------------|----------------------|---------------------|
| Operating time(min) | 140.50 ± 29.72 | 120.68 ± 40.39 |
| Blood Loss(ml) | 213.33 ± 102.50 | 426.70 ± 336.66 |
| Need for blood transfusion | 4(13.3%) | 21(35.6%) |
| Pain score | 2.70 ± 1.74 | 6.93 ± 1.28 |
| Return to normal activity | | |
| Good | 26(86.67%) | 40(67.79%) |
| Bad | 4(13.33%) | 19(32.20%) |
| Cost | Costlier than TAH | |

The laparoscopic hysterectomy patients required fewer antibiotics as compared to abdominal hysterectomy patients on account of less incidence of febrile morbidity and wound sepsis (Table 4) In the LAVH group, the major complications included bladder injury in one case(3.3%) Thermal bowel injury occurred in one patient(3.3%), which was detected intraoperatively & converted to laparotomy. Minor complications like wound infection was high 6.8% in TAH group. UTI was 13.3% among the LAVH group.

Table 4: Complications

| | LAVH | TAH |
|----------------------------|----------|---------|
| Major Complications | | |
| Bladder injury | 1(3.3%) | 1(1.7%) |
| Bowel injury | 1(3.3%) | NIL |
| Converted to laparotomy | 1(3.3%) | NIL |
| Reopened | NIL | 1(1.7%) |
| Vesicovaginal | NIL | 1(1.7%) |
| Wound dehiscence | NIL | 1(1.7%) |
| Intra abdominal sepsis | NIL | 1(1.7%) |
| Ureteric injury | NIL | 1(1.7%) |
| Minor complications | | |
| Fever | 2(6.7%) | 7(11.9) |
| UTI | 4(13.3%) | 3(5.1%) |
| Wound infection | NIL | 4(6.8%) |

4. DISCUSSION

In spite of the dramatic increase in the number of LAVH procedures being carried out at various centers, since its first description by Reich(5), its value remains controversial. Several authors have reported LAVH as an improved alternative to conventional abdominal hysterectomy(8,9). Other studies have been published discussing LAVH in an outpatient settings (8,10). Most authors agree that the primary focus and intention of LAVH should be to convert selected abdominal hysterectomies to a vaginal approach thus allowing for surgery in an ambulatory setting. Optimum surgical practice mandates that the severity of the pathologic disorder be the primary criterion in selecting the route of hysterectomy(11). Patients prefer this approach because of the far less postoperative pain, smaller abdominal incisions, shorter hospital stay and more rapid return to work or other activities. The indications to perform hysterectomy in our study were similar as reported by other authors(12,13).

The mean operative time taken for LAVH in our study was 140.50min and for TAH was 120.68min. A study by Kapoor Nisha reported a significant shorter duration of 63 minutes for LAVH(14). The longer operative time is due to the fact that the study was carried out during the learning curve. The average intraoperative blood loss of 213.33ml in the LAVH group was comparable to 116ml reported by Kapoor Nisha and 369 ± 57 ml reported by Kulvanitchaiyanunt (14,15). The variations in blood loss and operative time reported in the different studies can be explained by difference in mean uterine size, stage of learning curve and technique.

Postoperatively, pain scores assessed 48 hrs after the procedure were much higher for TAH as compared to the LAVH patients in our study. Similar results have been reported by other authors.

The activity score assessed at one postoperatively was considerably higher in the LAVH group vs the TAH group; comparable activity score has been reported in other studies. Mean hospital stay of 6 days in the LAVH group was much less than 10 days in the TAH group. Other authors have reported hospital stay varying from 2.7 days to 3.43 days. The length of the hospital stay not only varies from center to center but is also influenced by factors like concomitant surgery etc.

The incidence of major and minor complications was higher in the TAH group as compared to the LAVH group. Most of the patients accepted concomitant surgery more readily with LAVH as compared to open surgery due to cosmetic reasons. However critics of LAVH point to a prolonged operative time, higher incidence of complications and higher cost as compared to TAH. The higher cost of laparoscopic surgery is easily offset by shortened hospital stay, better cosmetic outcome, lesser postoperative pain and earlier return to work. Cost can further be curtailed by using bipolar non-staple technique.

5. CONCLUSION:

LAVH is a true advance in gynaecological surgery since it reduces perioperative morbidity, postoperative pain, intraoperative blood loss and complication rates. Hence it is more acceptable to both – the patients and the gynaecologists. In experienced hands, most of the abdominal

hysterectomies can easily be converted to vaginal route even in patients with previous abdominal surgeries, large uteri and complex adnexal masses. Higher costs and learning curve are the major constraints at present, which is future hopefully would be taken care of, as has happened in other laparoscopic procedures

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