

# **LAPAROSCOPIC ASSISTED VAGINAL HYSTERECTOMY VERSUS TOTAL LAPAROSCOPIC HYSTERECTOMY**

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## **ABSTRACT:**

There have been only few comparative studies on abdominal and vaginal hysterectomy including randomized controlled trials until introduction of laparoscopic hysterectomy. Most studies were retrospective and covered many years.

**INTRODUCTION** In 1988 laparoscopic hysterectomy stimulated great interest in proper scientific evaluation of all forms of hysterectomy [Harry Reich 1992 laparoscopic hysterectomy [1, 2]. From its inception laparoscopic hysterectomy was considered a substitute for abdominal hysterectomy and not for vaginal hysterectomy. Laparoscopic hysterectomy has never been indicated for hysterectomy if the operation is feasible by the vaginal route. However it remains a reasonable substitute for abdominal hysterectomy. Most hysterectomies currently requiring an abdominal route maybe performed with laparoscopic dissection in part or all of abdominal portion followed by removal of uterus vaginally.

This study involves a retrospective analytical review and compares laparoscopic assisted vaginal hysterectomy( LAVH) with total laparoscopic hysterectomy (TLH) 30 articles were reviewed including RCOG guidelines published in 2007 and NICE interventional procedure overview of laparoscopic techniques for hysterectomy [updated in December 2006. It also includes a systematic review and meta-analysis of 25 randomized control trials by Johnson Barlow, Garry et al published in British medical journal and the Cochrane database systematic reviews 2005.

**AIM** The aim of this study is to review indications of laparoscopic assisted vaginal hysterectomy and total laparoscopic hysterectomy for benign conditions such as leiomyomata, endometriosis, pelvic adhesions, pelvic pain, pelvic relaxation and abnormal uterine bleeding. It also includes 2 articles on role of TLH in malignant conditions like early endometrial and ovarian cancer. The reviews include surgical advantages, contraindications and complications associated with both types of laparoscopic hysterectomies. One article reviews the role of obesity, weight equal or more than 100 kg, while the other two review early discharge [home within 24 hrs] and cost.

**CONCLUSION:** Finally, comparative studies were reviewed to study rate of complications in both LAVH and TLH groups and complications are reported in terms of hemorrhage, bladder and ureteric injuries, and bowel injury. The operating time, analgesia need, post operative pain relief, early recovery, hospital stay cost involved, patients' satisfaction rate and quality was also reviewed.

## **KEYWORDS:**

Laparoscopy, total laparoscopic hysterectomy, laparoscopic assisted vaginal hysterectomy, complications.

## **INTRODUCTION:**

Hysterectomy is the most commonly performed gynecological surgical procedure. By the age of 60, nearly one in three women will have undergone hysterectomy. The most recent national surveillance data from 1994-1999 showed that 600,000 hysterectomies were performed yearly in the United States of which 90% were done for benign condition, however international hysterectomy rates vary, with the highest in the United States and the lowest in Norway and Sweden. In UK there are approximately 250,000 laparoscopic surgery performed on women.

There are 3 approaches to hysterectomy: abdominal hysterectomy (AH), vaginal hysterectomy [VH] and laparoscopic hysterectomy [LH]. LH has three further divisions: LAVH where a vaginal hysterectomy is assisted by laparoscopic procedure that does not include uterine artery ligation, laparoscopic hysterectomy [LH] where the laparoscopic procedure include uterine artery ligation, and total laparoscopic hysterectomy [TLH] where there is no vaginal component and vaginal vault is sutured by laparoscopic technique.

Laparoscopic hysterectomy [LH] was first performed in January 1988 by Harry Reich [1, 2] in Pennsylvania and is defined as the 'laparoscopic ligation of the major vessels supplying the uterus'. It is an alternative to abdominal hysterectomy with more attention to the identification of ureters. Abdominal hysterectomy should be done less frequently worldwide because LH can be used effectively to accomplish a less invasive laparoscopic or vaginal hysterectomy in most cases [1, 2].

The reason for the hysterectomy, risk and benefit of the procedure, alternatives and expectation for the outcome should be discussed with the woman in detail.

Informed consent with thorough exploration of patient preferences and expectation is particularly important. The vast majority is without problems, but there is serious complication in about 1 in 1000 [3].

There are many surgical advantages to laparoscopy, particularly magnification of anatomy and pathology, easy access to the vagina and rectum, and the ability to achieve complete haemostasis. There are multiple patient advantages such as avoidance of painful abdominal incision, reduced duration of hospitalization and recovery and extremely low rate of infection.

The goal of vaginal hysterectomy, [LAVH or LH] is to safely avoid an abdominal wall incision, with resultant benefits. In LAVH, laparoscopic inspection at the end of the procedure permits the surgeon to control any bleeding and evacuate clots. Laparoscopic cuff suspension may limit future vault prolapse. Laparoscopic hysterectomy is not indicated when vaginal hysterectomy can be easily and safely done.

There are a variety of operations where laparoscopy is used as an aid to hysterectomy [Reich classification]:

- Diagnostic laparoscopy with vaginal hysterectomy – indicates that laparoscopy is used for diagnostic purposes to determine if vaginal hysterectomy is possible and also to assure vaginal cuff and pedicle haemostasis and allows clot evacuation.
- Laparoscopic assisted vaginal hysterectomy [LAVH] – a vaginal hysterectomy after laparoscopic adhesiolysis, endometriosis excision or oophorectomy.
- Laparoscopic hysterectomy [LH] – denotes laparoscopic ligation of the uterine arteries either by electro surgery, suture ligature or staples. All surgical steps after the uterine vessels desiccation can be performed either vaginally or laparoscopically. Laparoscopic

ligation of the uterine vessels is the sine qua non for laparoscopic hysterectomy. Identification of ureters is always advised.

- Total laparoscopic hysterectomy [TLH] – here the laparoscopic dissection continues until the uterus lies free of all attachment in the peritoneal cavity. The uterus is removed through the vagina with morcellation if necessary. The vagina is closed with sutures applied laparoscopically. No vaginal surgery is done unless morcellation is necessary [3]. Laparoscopic hysterectomy includes all cases using the laparoscope. LAVH is really a vaginal hysterectomy [almost all LAVH's can be done as complete vaginal hysterectomies]. TLH implies that a vaginal hysterectomy will be difficult or impossible to perform i.e., TLH is a substitute for abdominal hysterectomy but not for vaginal hysterectomy.
- Laparoscopic supracervical hysterectomy [LSH] – a less risky procedure with decreased risk of ureter dissection. The uterus is removed by morcellation from above or below.
- Laparoscopic pelvic reconstruction [LPR] with vaginal hysterectomy.

### **AIM OF THE REVIEW:**

The aim of this study was to compare the safety, effectiveness and complications of total laparoscopic hysterectomy and laparoscopic assisted vaginal hysterectomy for benign and malignant conditions and obese patients. The following parameters were evaluated: operative time, hemorrhage, infection, urinary tract complications, bowel injury, peritonitis after unrecognized or delayed perforation, post-operative pain and requirement of analgesia, hospital stay, time to recovery, hospital costs, patient satisfaction and quality of life, complications unique to laparoscopy e.g. injury to abdominal wall vessels, injury to large vessels, trocar site incisional hernias, instrument failure.

### **MATERIALS AND METHODS:**

Rapid review of literature was carried out. The medical literature was searched to identify reviews and studies relevant to TLH and LAVH.

Searches were conducted by the following data bases: Medline, Google, Pubmed, HighWirePress, RCOG and Nice guidelines and Online Springer facility available at Laparoscopy Hospital, New Delhi.

### **LAPAROSCOPIC ASSISTED VAGINAL HYSTERECTOMY [LAVH]:**

In LAVH the procedure is done partly laparoscopically and partly vaginally but the laparoscopic component does not involve uterine artery ligation.

There is evidence that vaginal route of surgery is associated with fewer complications and faster recovery, still two- thirds of the hysterectomies are performed abdominally.

Diagnostic and operative laparoscopy has lead to an increasing number of hysterectomies performed vaginally, although laparoscopy may lead to serious complications. LAVH is a useful adjunct to vaginal hysterectomy for lysis of extensive adhesions and sometimes for certain concomitant adnexal surgery. LAVH can also secure the uterine vessels and adnexal collateral arterial branches.

### **COMPARATIVE STUDIES:**

Kuzel D. et al [5] subjected 100 women to LAVH and evaluated the rationale of laparoscopy. Their results included mean operation time as 80 minutes [range 55-180] and mean operation time of laparoscopic part was 35 minutes [range 25 – 45 minutes].

They concluded that the main contribution of laparoscopy for the purpose of vaginal hysterectomy remains the assessment and treatment of dense pelvic adhesions or adnexal pathology rather than hysterectomy itself. Bipolar coagulation of ovarian vessels decreases the blood loss in cases of enucleation or morcellation of myomas during the vaginal part of the operation. Estimated blood loss was 300ml [range 100-550ml]. Two patients had dense pelvic adhesions and had adhesiolysis that caused vaginal part of surgery as safe. Ten complications were encountered per operatively [3 cases of vaginal bleeding and 1 from ovarian vessels]. 3 had pelvic inflammatory diseases. 2 had injury of urinary bladder recognized and treated during surgery.

Thus this study concluded that the main contribution of laparoscopy for the purpose of vaginal hysterectomy remains assessment and treatment of dense/pelvic adhesions or adnexal pathology rather than hysterectomy.

In the initial Nashville, Tennessee experiences Daniell JF et al [6] reported successful experience with LAVH in 62 out of 68 patients in 1993. Postoperative satisfaction with the operation was high [95%]. They concluded that laparoscopically assisted vaginal hysterectomy is a safe, effective operation in selected cases and may soon become a common alternative to abdominal hysterectomy in certain cases.

A randomized, prospective study of short term outcome was carried out to by Ottosen C et al [7] to study three methods of hysterectomy with 40 cases in each arm. The outcome measures were:

- Duration of surgery
- Anesthesia
- Time in hospital
- Recovery time

They concluded that traditional vaginal hysterectomy was a feasible and faster operative procedure compared with laparoscopic assisted vaginal hysterectomy. Vaginal hysterectomy should be therefore a primary method for uterine removal.

Olsson JH et al [8] carried out a randomized prospective trial comparing laparoscopic and abdominal hysterectomy. They compared short term clinical results - 143 women were prospectively randomized to undergo the procedure by laparoscopic hysterectomy or abdominal hysterectomy. During laparoscopic hysterectomy, the uterine arteries as well the upper part of cardinal ligaments were transected laparoscopically. The peri operative and post-operative results were compared. They concluded that laparoscopic hysterectomy is a safe procedure for selected patients and offers advantages such as less intra operative blood loss, less post operative pain, shorter time in hospital and shorter convalescence.

In 1996 Stovall and Summitt conducted two parallel multicentre randomized trials in UK. They compared the effects of laparoscopic hysterectomy and abdominal hysterectomy in the abdominal trial and laparoscopic hysterectomy and vaginal hysterectomy in the vaginal trial [9]. They concluded that well designed clinical trials examining short term outcomes, economics, and quality of life were required to determine the role of laparoscopic hysterectomy.

Ten previous randomized trials have compared outcomes for abdominal hysterectomy with laparoscopic hysterectomy. Each trial showed that laparoscopic hysterectomy was associated with reduced hospital stay and less pain than abdominal hysterectomy. Mean operating time was significantly longer for laparoscopically assisted vaginal hysterectomy [179.8 mins vs 146.0 mins]. There were no differences of blood loss or incidence of intra operative complications. There was a higher incidence of wound complication in the abdominal hysterectomy group but no difference in post operative complications. LAVH required a significantly shorter mean hospital stay [2.1 days] and convalescence 28.0 days than abdominal hysterectomy. There were no significant differences in mean hospital charges between the 2 groups. They concluded that except for operating time, there are no difference between LAVH and abdominal Hysterectomy regarding the intra-operative characteristics.

The safety of the various procedures i.e. vaginal, abdominal and laparoscopic hysterectomy in routine gynecological practice was investigated in the eVALuate study [10]. It consisted of 2 parallel multicenter randomized control trials, one comparing laparoscopic with abdominal hysterectomy and the other comparing with laparoscopic with vaginal hysterectomy. The objective was to compare the effects of laparoscopic hysterectomy and abdominal hysterectomy in the abdominal trial, and laparoscopic hysterectomy and vaginal hysterectomy in the vaginal trial. The study involved 28 UK centers and 2 South African centers, 1380 women were recruited, 1346 had surgery, 937 were follow-up for 1 year. In the vaginal arm of the trial 168 women had vaginal hysterectomy and 336 had laparoscopic surgery with one of the four approaches: laparoscopic hysterectomy, LAVH, laparoscopic supracervical hysterectomy and total laparoscopic hysterectomy. Their results revealed that abdominal trial laparoscopic hysterectomy was associated with a higher rate of major complication than abdominal hysterectomy [11.1 % vs 6.2%]. Laparoscopic hysterectomy also took longer to perform [84 mins vs 50 mins] but was less painful and resulted in a shorter stay in a hospital after the operation [3 days vs 4 days]. In the vaginal trial there was no evidence of difference in major complication rates between laparoscopic hysterectomy and vaginal hysterectomy [9.8% vs 9.5%]. However laparoscopic hysterectomy took longer to perform [72 mins vs 39 mins] and was associated with a higher rate of detecting unexpected pathology. The study concluded that laparoscopic hysterectomy was associated with a significantly higher rate of major complications than abdominal hysterectomy. It took longer time to perform but it was associated with less pain, quicker recovery and better short term quality of life. The trial comparing vaginal hysterectomy with laparoscopic hysterectomy was inconclusive on the rate of major complications however vaginal hysterectomy took less time.

Wen-Chun Chang et al [11] studied 452 patients retrospectively to undergo laparoscopic assisted vaginal hysterectomy or trans vaginal hysterectomy for non prolapsed uteri. In this research they defined a rational guideline for the use of either LAVH or trans vaginal hysterectomy with a non prolapsed uterus. 284 patients underwent trans vaginal hysterectomy and 168 patients had laparoscopic assisted vaginal hysterectomy. The average operating time was 139 mins in the trans vaginal hysterectomy group with larger uteri [more than 350 gms] and was significantly longer than that in the LAVH group [118 min]. Their study concluded that trans vaginal hysterectomy had a longer operative time and more blood loss, however neither operative time nor estimated blood loss was affected by uterine weight in the LAVH group with a larger uterine size [cut off value at 350 gms].

Uterine volume plays an important role - the average operative time for LAVH was longer as it takes time to secure the blood supply before volume reducing procedure. LAVH might be considered for a larger uterus in view of a relatively shorter operating time and less blood loss.

E. David Montefiore [12] carried out a prospective observational multicenter study to examine the route and complication of hysterectomy for benign disorders. Hysterectomy was performed by laparoscopic, laparoscopically assisted vaginal hysterectomy, laparotomy and vaginal route. The operating time was shorter with the vaginal route than with the laparoscopy, laparotomy and LAVH. Intra and post operative complication were significantly more frequent in the laparotomy group [18%] compared with vaginal group [8.2%], the laparoscopic group [5.8%] and the LAVH group [8.2%]. The study concluded that vaginal route is increasingly used for hysterectomy in France and it is the route of choice for benign disease

The NICE [13] interventional procedure overview of laparoscopic techniques for hysterectomy reviewed the COCHRANE systematic review and meta-analysis by Johnson N et al [2006] which included 27 RCT's that had 3643 patients and 25 randomized control trials which included laparoscopic technique for hysterectomy: LH [laparoscopic hysterectomy] vs AH [abdominal hysterectomy] : 20 trials, n = 2532, LH vs VH [vaginal hysterectomy] : 8 trials n = 945, LAVH [laparoscopic assisted vaginal laparoscopy] vs LH : 1 trial, n= 101.

The main results of laparoscopic techniques vs. AH were the lower intra operative blood loss, shorter duration of hospital stay, and quicker return to normal activities ,There were fewer wound or abdominal wall infections, fewer febrile episodes at the cost of longer operative time and more urinary tract injuries [bladder or ureter]. There was no evidence of benefits of laparoscopic techniques vs. VH and the operating time was increased in LH. There was no evidence of LH vs LAVH and the operating time was increased for LH.

The author's conclusion suggested VH should be performed in preference to AH where possible. Where VH is not possible LH may avoid the need for AH; however the duration of surgery increased as the extent of the surgery performed laparoscopically increases, especially if the uterine arteries are divided Laparoscopically. Laparoscopic approaches also require greater surgical expertise.

The surgical approach to hysterectomy should be decided by a woman in discussion with her surgeon in light of the relative benefits and hazards.

### **TOTAL LAPAROSCOPIC HYSTERECTOMY [TLH]:**

Total laparoscopic hysterectomy involves the entire operation including suturing of the vaginal vault done laparoscopically. The early stages of TLH are performed in the same way as LAVH. Haemostasis of the uterine vessels may be achieved with bipolar forceps using intermittent small applications [14] or by retroperitoneal uterine artery sealing using LigaSure [15]. This method requires the highest degree of surgical skill and is currently done only by a very small proportion of gynecologists. It is not clear whether total laparoscopic hysterectomy offers any advantage over other forms of hysterectomy [16].

Compared to abdominal and vaginal hysterectomy TLH is a recent technique which has only been performed for the past 6 years. It allows the surgeon the best option provided patient safety is maintained by timely conversion to laparotomy when necessary [14].

TLH involves technical challenges and prolonged operating time, however it may be the method of choice in situations where the pubic angle is narrow, the vagina is small, or the uterus is high or immobile. In such cases LAVH is difficult to perform. However a wider adoption of TLH

would depend on the development of new and simplified techniques that would reduce complication and operation time [17].

A study carried out by Charles Chaperon et al [18] reported that TLH is a recently developed technique and is safe, feasible and reproducible. However TLH is only indicated when vaginal hysterectomy is contraindicated or impossible. An immobile uterus and poor vaginal access is the main indication for TLH. Thus TLH constitute an alternative to laparotomy rather than to vaginal hysterectomy. Another study [19] evaluated a cumulative 3 year experience of total 222 patients. The overall complication rate was 10%, the results were encouraging provided the surgeon has the expertise in laparoscopic surgery. TLH does not have a higher rate of complication than AH or VH.

Christopher and Bernard et al [20] carried out a 5 year retrospective study of 503 women who underwent TLH [from Jan 2001 – Jan 2005]. The aim was to evaluate the surgical techniques with regards to the success of TLH for the removal of the uterus and to analyze intra operative and post operative outcome and complications in order to reduce their occurrence. The results reported were mean uterine size 11 cm [5-17] mean operating time was 133 mins., mean blood loss 309 ml, 23 women [4.5 %] had major complication like conversion to laparotomy, excessive bleeding, ureteric injury, bowel injury, and pulmonary embolism. This compares favorably with other centers with complication rate of 4 – 11 %. They concluded that TLH with adequate training is associated with low morbidity, few complications and a high success rate.

The TLH has been described over the last 10 years as potentially quicker, and associated with less blood loss than LAVH. The term TLH means that all surgery is performed entirely through the laparoscopic ports.

This study evaluated the success of the TLH technique for the removal of the uterus by analyzing its intra operative and post operative outcomes and complications in order to reduce their occurrence. The KOH Colpotomizer system and the RUMI uterine manipulator were used. 503 women had successful TLH with 3 minilaparotomy and 6 laparotomy conversion [1.8% failure rate]. The mean operating time, mean estimated blood loss, mean hospital stay and readmission rate are comparable. The study concluded that TLH with adequate training is associated with low morbidity few complication and a high success rate.

Johnson, Barlow, et al [16] [Cochrane database of systematic reviews 2007 issue 2] compared the surgical approach to hysterectomy for benign gynecological disease in randomized control trials. Only randomized trials were compared. The study concluded that significantly improved outcomes for VH in preference to AH were possible. Where VH is not possible, LH may avoid the need for AH, however the length of the surgery increased as the extent of the surgery performed laparoscopically increases particularly when the uterine arteries are divided laparoscopically. The laparoscopic approach requires greater surgical expertise. However further research is required to define the role of the newer approaches to hysterectomy such as TLH.

Cheng Yu Long, et al [21], compared the surgical results of 60 women undergoing LAVH and 41 having TLH for benign condition. The study concluded LAVH has advantages over TLH with reduced operating time. TLH can be effectively performed within reasonable time limits in selected cases; however it is a technical challenge. The effects on sexual function following either TLH or LAVH are found to be similar.

Anil Gudi and Al Samarraï [25] evaluated experience in laparoscopic hysterectomy over 9 years in a UK district general hospital, and evaluated 363 women who underwent laparoscopic hysterectomy from Jan 1993 – Jan 2002. Operating time was 86.4 mins, while the hospital stay was 2.7 days. For 2 years, ENDO GIA was used. 291 cases of laparoscopic hysterectomy had cardinal and uterosacral ligaments transected via a laparoscopic route. Bowel complication was 0.55% ureteric complication were 0.55% while bladder complication were 0.826% and one patient died. The overall complication rate was 0.85% which is comparable to other studies. They concluded that the uptake of laparoscopic hysterectomy continues to be low in United Kingdom and the aim should be to change practice by more training in minimal access surgery in order to offer the benefits of laparoscopic hysterectomy.

Retroperitoneal uterine artery sealing with LigaSure was performed in 50 women by Mert Gol et al.[15] They concluded that LigaSure is effective, safe and a fast procedure with less intra operative bleeding, short operation time and hospital stay.

### **TLH FOR ENDOMETRIAL CANCER:**

Traditional therapy for uterine neoplasia includes total abdominal hysterectomy with salpingo oophorectomy and if tumor stage is higher than stage 1 or tumor grade is 3, lymph node sampling is performed. In 1993 LAVH with node dissection was described as an alternative TAH for clinical stage 1 endometrial cancer patients. LAVH has also been shown to be appropriate for women of age over 75 with endometrial cancer, with a similar blood loss, lesser or higher node counts, longer operating time, shorter hospital stage, and less pain than TAH [22].

LAVH is predicted upon the ability to dissect the cervix and lower uterine segment through the vagina. Obesity, nulliparity, and senior age; the three most common risk factors for endometrial cancer, all contribute to make the vagina longer and narrower. Thus it may be more difficult to complete the vaginal portion of the LAVH. Many obese, senior and nulligravid women will not qualify for LAVH because they lack sufficient uterine prolapse or vaginal capacity.

The TLH has been described over the last 10 yrs as a potentially quick and efficient method with less blood loss than LAVH. In 2003 the study [22] reported TLH data and observed it to be safe in obese patients with pelvic and early ovary cancer. However a randomized clinical trial would be the standard for confirming the indication, safety, accuracy and complication rates of TLH in women in endometrial neoplasia.

The study also concluded both LAVH and TLH can be performed successfully with similar surgical outcomes in endometrial cancer. Obese patients benefit more from TLH than LAVH in terms of shorter operating time.

F Ghezzi et al [23] carried out a study to compare LAVH and TLH for the treatment of endometrial cancer in a randomized control trial [Canadian task force classification 1].

They recruited 72 women with endometrial cancer and randomized them to either undergo LAVH or TLH. Parameters assessed were operating time of hysterectomy phase, estimated blood loss, and peri operative complications. The mean operating time was significantly shorter in TLH than in the LAVH group. The hysterectomy phase was longer in the LAVH than in the TLH group only in the overweight and obese patients.



The estimated blood loss was similar in both groups. Intra operative complication occurred in 3 patients [8.1%] in LAVH group and 1 patient [2.8%] in the TLH group. No difference was found in the post operative complication rate. The study concludes that both LAVH and TLH can be performed successfully to manage endometrial cancer, with similar surgical outcomes. Obese patients benefit more from TLH than from LAVH in terms of shorter operating time.

Andreas Obermair, Tom p. Manolitsas et al, [24] studied the impact of laparoscopic surgery on the patterns of recurrence and survival. They concluded incidence of port-site metastasis in early stage endometrial cancer treated by TLH is low. Laparoscopic management does not seem to worsen the prognosis of patient with endometrial cancer.

### **QUALITY OF LIFE AND SURGICAL OUTCOME AFTER TOTAL LAPAROSCOPY HYSTERECTOMY:**

Minimal invasive surgery aims to achieve at least a similar clinical effectiveness with a quicker recovery than traditional open techniques. Only few studies have compared quality of life after different types of hysterectomy. No study has evaluated total laparoscopy hysterectomy. In a randomized control trial Kirsten B, et al evaluated abdominal versus laparoscopic hysterectomy. The Dutch version RAND-36 health survey was carried out pre operatively as well as 12 weeks after surgery. The primary outcome of the study was quality of life as measured by the RAND-36. Laparoscopic hysterectomy performed better on all other scales of the RAND-36 but these differences were not statistically significant.

The study concluded laparoscopic hysterectomy results in more post operative vitality when compared with abdominal hysterectomy. All women with a benign condition in whom laparoscopic approach is feasible should have the chance to choose laparoscopic hysterectomy [26]. But there is no significance in quality of life in the LAVH and TLH group.

### **TOTAL LAPAROSCOPIC HYSTERECTOMY IN OBESE VERSUS NON-OBESE PATIENTS:**

In the past decade, the prevalence of obesity in the United States has reached epidemic proportion. The adverse effect of obesity on mobility and quality of life are well established. The advent and rapid evolution of modern laparoscopic surgery has allowed the surgeon with a powerful tool making possible more complex procedures using minimal invasive techniques.

Laparoscopic techniques may be suitable in obese patients because surgical complications are related to poor healing of surgical wounds and infection when diabetes is present. A retrospective cohort study of short term clinical outcomes was performed for all patients who underwent total laparoscopic hysterectomy at Ochsner Clinic Foundation in New Orleans from February 1998 through June 2002. The risk of operative and post operative complications was estimated in these patients.

Despite technical challenges especially with patients with BMI greater than 30 kg/ m<sup>2</sup>, a laparoscopic approach is well suited to the obese patient, who is inherently less mobile and therefore, more susceptible to thromboembolic events and sub optimal wound healing following laparotomy. The study concluded that total laparoscopic hysterectomy can be performed safely for obese patients, with complications rates similar to those for non-obese patients [27].

## **POST OPERATIVE ANALGESIC REQUIREMENTS – TOTAL LAPAROSCOPIC HYSTERECTOMY VERSUS VAGINAL HYSTERECTOMY:**

The study by Marcelo Carraro et al, [28] carried out chart review of 53 patients who had TLH and 47 who had VH and were seen post operatively by an acute pain management service in order to assess post operative analgesic requirements. The team concluded that patients submitted to TLH require less post operative analgesic drugs when compared with patients who had VH. But there is no significant difference in the pain scores between LAVH and TLH.

## **FACTORS ASSOCIATED WITH INCREASED CHARGES FOR HYSTERECTOMY:**

A retrospective cohort study of 686 patients was made using medical chart review and hospital financial information. The results included factors associated with higher charges for hysterectomy. These were blood loss greater than 1000 ml operative time 105 mins or more, increasing length of hospitalization, the use of prophylactic antibiotics and the laparoscopic surgical approach compared with vaginal hysterectomy. [29]

Cost of TLH is more compared to LAVH due to more operative time and use of morcellator and other expensive instruments like harmonic scalpel and ligasure. Some surgeons use ENDO GI LINEAR STAPLER which increases the cost of TLH further.

## **HOME WITHIN 24 HOURS OF LAPAROSCOPIC HYSTERECTOMY:**

Chou DC et al [30] assessed the feasibility of safe discharge home within 24 hours following laparoscopic hysterectomy in 30 patients who met the inclusion criteria and consented to be enrolled. Patients were admitted on the day of their surgery with the expectation of discharge within 24 hours. All 30 operative procedures were completed without incident. 6 patients underwent TLH and 24 patients underwent LH. There were no intra operative complications. Post operative complications were minor. 90% patients were discharged within 24 hours of their surgery. The average duration of stay was 22.9 hours. The study concluded that laparoscopic hysterectomy can be associated with the reduction in length of patient stay compared to traditional laparotomy. Furthermore, this reduction can be safely reduced to 24 hours following laparoscopic hysterectomy. There was also an associated cost saving in terms of in-patient bed days. Patient satisfaction with this protocol was high in this selected and motivated group.

## **DISCUSSIONS:**

There have now been many randomized controlled studies comparing total laparoscopic hysterectomy and laparoscopic assisted vaginal hysterectomy. These all show quicker recovery, less complication, and less patient discomfort with both the laparoscopic approach. . The conclusion from a careful review of the above literature is that laparoscopic vaginal hysterectomy and total laparoscopic hysterectomy are associated with more rapid recovery and with no greater risk of complications in the hands of a surgeon with expertise .. Post operative pain is less and need for analgesia is reduced.

This article compares laparoscopic assisted vaginal hysterectomy versus total laparoscopic hysterectomy. Women in this review article who underwent LAVH had a shorter hospitalization but longer operating room time . They also experienced a rapid recovery and quicker return to normal activities. The primary advantages of LAVH are shorter hospitalization, reduced requirement for drugs to control postoperative pain, and faster return to normal activities.

LAVH had a significantly shorter operating time, fewer complications and faster recovery than

total laparoscopic hysterectomy. Diagnostic and operative laparoscopy has led to an increasing number of hysterectomies performed vaginally, although laparoscopic component may lead to serious complications. LAVH is a useful adjunct for trans vaginal hysterectomy, for lysis of extensive adhesions and sometimes concomitant adnexal surgery. LAVH can also secure the uterine vessels and adnexal collateral in selective cases. Total laparoscopic hysterectomy was associated with an increased incidence of urinary tract injury [bladder and ureter] and urinary tract damage, thus - ureteric injury remains a major concern in relation to the total laparoscopic approach. Although many gynecologists in training are now exposed to laparoscopic hysterectomy, very few newly trained gynecologists will have sufficient efficiency and confidence to tackle total laparoscopic hysterectomy, which requires the highest level skills.. Total laparoscopic hysterectomy is a recent technique which has only been performed for the past few years. TLH involves technical challenge and highest level skills and prolonged operating time, It is the method of choice in situations where the pubic angle is narrow, the vagina is small, or the uterus is high or immobile. In such cases, LAVH has a reduced chance of success. However, a wider adoption of TLH would depend on the development of new and simplified techniques that would reduce complications and operation time ..

## **CONCLUSION:**

Recent advances in equipment, surgical techniques and training have made total laparoscopic hysterectomy a well tolerated and efficient technique. The future place of laparoscopic hysterectomy will be determined by the increased familiarity and skill of surgeons with vaginal procedure, stimulated by doing the difficult part of a 'laparoscopic assisted vaginal hysterectomy'.

There are many good indications of TLH in patients with previous abdominal surgery, multiple fibroids, limited vaginal access, nulliparity or broad ligament myoma. In other group of patient LAVH should be considered a better option than TLH because of more skill, more operative time and more cost of surgery. Total Laparoscopic hysterectomy has a genuine concern of ureteric injury. So in normal uncomplicated uterus LAVH or even vaginal hysterectomy has no disadvantages and remains an excellent option.

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