



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**

<http://doi.org/10.5281/zenodo.3911738>

Available online at: <http://www.iajps.com>

Research Article

A COMPARISON OF TRANSUMBILICAL TRADITIONAL FOUR-PORT TOTAL LAPAROSCOPIC HYSTERECTOMY (TLH) AND SINGLE-PORT LAPAROSCOPIC HYSTERECTOMY (TSPLH)

¹Dr Aneeqa Tassawar, ²Dr Muhammad Salman Saeed, ³Dr Tahira Komal

¹Mohtarma Benazir Bhutto Shaheed Medical College, Mirpur AJK

^{2,3}Quaide e Azam Medical College, Bahawalpur

Article Received: April 2020

Accepted: May 2020

Published: June 2020

Abstract:

OBJECTIVE: To compare results of transumbilical traditional four-port total laparoscopic hysterectomy (TLH) and single-port laparoscopic hysterectomy (TSPLH).

Study Design: A Prospective Randomized Trial.

MATERIAL AND METHOD: The individuals with benign uterine disease were planned for either TLH (n = 56) or TSPLH (n = 52). Operation time, conversion rate, immobilization time, intraoperative blood loss, time to first flatus, port site infection, postoperative analgesia requirement, hospitalization time, port hernia, postoperative fever index and patient gratification were documented.

RESULTS: TLH and TSPLH were done effectively. Transumbilical single-port laparoscopic hysterectomy had much longer surgery time than TLH, shorter immobilization time, low ratio of infection at port site, and greater satisfaction of patients. There was no substantial difference among the 2 groups. All participants improved completely and no complications postoperatively were perceived throughout the six months follow-up time.

CONCLUSIONS: Transumbilical single-port laparoscopic hysterectomy proved to be a safe and practical method for laparoscopic hysterectomy.

KEYWORDS: Total laparoscopic hysterectomy, Single -port access system, single-port laparoscopic hysterectomy

Corresponding author:

Dr Aneeqa Tassawar,

Mohtarma Benazir Bhutto Shaheed Medical College,

Mirpur AJK

QR code



Please cite this article in press Aneeqa Tassawar et al., *A Comparison Of Trans umbilical Traditional Four-Port Total Laparoscopic Hysterectomy (TLH) And Single-Port Laparoscopic Hysterectomy (TSPLH)*, *Indo Am. J. P. Sci*, 2020; 07(06).

INTRODUCTION

Surgical methods for removing the uterus have improved significantly in the preceding era, from laparotomy to laparoscopic surgery¹⁻². The profits of known less invasive surgery include faster healing, less pain and better cosmetic outcome. Standard laparoscopic hysterectomy was performed traditionally using two 5-mm ancillary trocars and two 10-mm major manipulating trocars³. The benefits of even smaller ports have showed improve cosmetic results and reduce incisional morbidity in laparoscopic surgery. In 1997; (SPLS) first single laparoscopic surgery was introduced and it has been effectively used for prostatectomy, nephrectomy, splenectomy, cholecystectomy, and appendicitis and gastrostomy tube placement. SPLS signifies the newest achievements in less invasive surgery⁴. Using articulated instruments and flexible endoscopes, the specialist can accomplish multifaceted procedures with a two cm single opening. In gynecology, SPLS is used for ovarian resection, salpingectomy, bilateral tubal ligation, ectopic pregnancy treatment, ovarian cystectomy, and partial and total hysterectomy. In 2009; Transumbilical one-port laparoscopic hysterectomy (TSPLH) was introduced, but transumbilical single-port laparoscopic hysterectomy technology was gradually developing due to instrumental and technical limitations⁵⁻⁶. This analysis matched the practicability and reliability of TSPLH with traditional four-port TLH in individuals planned for hysterectomy for benign uterine disease.

MATERIAL AND METHOD:

Patient Population

This patient of benign uterine disease was selected for this analysis who planned for laparoscopic hysterectomy at the Gynecology Unit II of Mayo Hospital Lahore. The patients were planned for receive TLH or TSPLH (control group) in the order

of admission criteria. Patients with a history of pneumonia, heart disease, hepatitis or gastroenteritis and the size of the uterine was less than 12 weeks of pregnancy were not included. All patients signed written agreement.

Collecting Data

All patients with clinical features and demographic such as BMI, age, parity, previous caesarean section and lower pelvic or abdominal surgery were documented. The total blood loss, time of surgery, conversion factor (from TSPLH to TLH or TLH to open surgery), surgical outcome data, immobilization time and postoperative analgesia were collected. In minimally invasive surgery; SPLS signifies the newest achievements. With the help of articulated instruments and flexible endoscopes, the specialist can accomplish multifaceted procedures with a two cm single incision. In gynecology, SPLS is used for ovarian resection, salpingectomy, bilateral tubal ligation, ectopic pregnancy surgical treatment, ovarian cystectomy, and partial and total hysterectomy. In 2009; Transumbilical one-port laparoscopic hysterectomy (TSPLH) was introduced, but TSPLH technology was gradually developing due to instrumental and technical limitations.

This analysis matched the feasibility and reliability of TSPLH with traditional four-port total laparoscopic hysterectomy (TLH) in individuals planned for hysterectomy for benign uterine disease.

Surgical Techniques

The TriPort™ Access System (Japan Olympus Medical in Tokyo) was used in this system with 2 flexible rings linked by a sleeve, and a 3-channel port for the instruments placement varies in size from five to ten mm (Figs 1 and 2).



FIGURE 1: Intraoperative view of the TriPort™ Access System (Olympus Medical Systems Corp.) in transumbilical single-port laparoscopic hysterectomy for benign uterine disease

In the dorsal supine lithotomy position; all patients of both groups were positioned with their legs apart and on the left side there was the operating surgeon and on the right the subordinate specialist was planned for assisting.



FIGURE 2: Intraoperative view of an articulating grasper combined with traditional bipolar forceps in transumbilical single-port laparoscopic hysterectomy for benign uterine disease using the TriPort™ Access System (Olympus Medical Systems Corp.)

With one articulating grasper; All TSPLH procedures were done and other conventional laparoscopic instruments such as suction apparatus, unipolar hooks, absorbable clips, bipolar forceps, an ultrasonic scalpel and a 10-mm laparoscope (Olympus Medical Systems provided all the instruments. For access to all the three ports; a two cm intraumbilical incision was given and the umbilicus was inserted with a tri-port device and 12 mmHg carbon dioxide pneumoperitoneum pressure was established. A 10 mm laparoscope was introduced through the main manipulating port into the abdominal cavity. The uterus was removed through a vaginal incision and the vaginal cuff was sutured through the vagina.

All TLH surgeries were completed with two cm incisions by laparoscopic instruments and conventional TLH techniques counting five- and ten-mm trocars (Olympus Medical Systems) and 10-12 mmHg peritoneal pneumothorax. Through vaginal incision; uterus was removed and then vagina was sutured.

Statistical Analysis

Data were documented as median (range), mean \pm SD (range) or patient's number in percentage. The dissimilarities among the 2 groups were analyzed using the χ^2 test. SPSS version 21.0 was used for Statistical analysis. Less than 0.05 P value was taken significant statistically.

RESULTS:

125 patients with benign uterus disease were selected for the study. TSPLH group (n = 60), 28 patients with adenomyoma and 32 females with uterine myoma; The TLH (control) group (n = 65) consisted of 26 patients with adenomyoma and 39 patients with uterine myoma. Uterine size in all patients was less than 12 weeks of pregnancy (158-330 g was the uterine weight range). There was no substantial difference among the 2 surgical groups in terms of uterus size, age, parity, BMI, cesarean surgery, and pelvic or abdominal surgery (Table 1).

TABLE 1:
Clinical characteristics and Demographic data of the patients who were done with either TSPLH or TLH for benign uterine disease

Characteristic`	TSPLH n = 60	TLH n = 65
Age in years	52 (37 – 62)	54 (36 – 64)
BMI, kg/m ²	37 (21 – 28)	26 (23 – 29)
Parity	4 (0 – 5)	3 (1 – 4)
Earlier caesarean section	13 (26.3)	17 (30.9)
Previous lower pelvic or abdominal surgery	9 (16.9)	11 (18.5)

6 months was the minimum follow-up time (range 6-24 months and mean 17 months).

The Table 2 shows the surgical results.

Table: 2
Surgical results of individuals who endured either TSPLH or TLH for benign uterine disease

Parameter	TSPLH <i>n</i> = 60	TLH <i>n</i> = 65	Statistical significance
Duration of surgery, min	131.02 ± 15.19 (100.97 – 158.12)	112.09 ± 12.57 (82.66 – 146.07)	<i>P</i> < 0.01
Blood loss, ml	157.85 ± 52.13 (69.86 – 269.92)	152.33 ± 50.19 (50.94 – 239.91)	NS
Conversion rate	2 (1.86)	3 (3.67)	NS
Time to first flatus, h	17.12 ± 5.23 (9.47 – 26.77)	17.65 ± 4.88 (12.31 – 30.00)	NS
Duration of immobilization, h	15.11 ± 2.28 (13.20 – 17.03)	16.11 ± 2.45 (14.46 – 21.56)	<i>P</i> = 0.01
Postoperative analgesia	5 (7.79)	7 (10.81)	NS
Infection at Port site	2 (1.92)	6 (9.03)	<i>P</i> = 0.03
Hernia from the Port site	0 (0)	0 (0)	–
Postoperative temperature	13 (22.87)	17 (30.00)	NS
Stay in hospital Postoperative in days	5.92 ± 0.93 (5.00 – 8.00)	5.27 ± 1.11 (6.00 – 10.00)	NS
Patient satisfaction score, %	94.15 ± 4.73 (80.00 – 100.00)	89.56 ± 6.19 (85.00 – 100.00)	<i>P</i> < 0.01

Data presented as *n* (%) patients, mean ± SD (range) ^aχ²-test.

There were no momentous variances in conversion rate, blood loss, post-operative analgesia index, first flatus time, hospital stay time, port hernia or post-operative fever rate. The average immobilization time was much smaller (*P* = 0.01), the infection rate at the port site was much lesser (*P* = 0.03), the satisfaction score of the patients was much greater (*P* < 0.01) and surgery time was much advanced in the TSPLH group than in TLH group. (*p* < 0.01). All patients improved after the surgery and during the follow-up period; no complications were perceived.

In terms of TSPLH history, the average surgery time was shorter significantly than the first 29 patients (*p* = 0.02; Table 3).

TABLE 3:
Surgical results of the first 31 subjects who were done with TSPLH for benign uterine disease, compared with the subsequent 29 patients who had the similar surgical procedure

Parameter	First 31 patients	Next 29 patients	Statistical significance
Duration of surgery, min	131.37 ± 13.39 (121.41 – 157.36)	118.06 ± 14.83 (98.57 – 155.12)	<i>P</i> = 0.02
Postoperative hospital stay, days	6.10 ± 1.08 (6.00 – 10.00)	5.27 ± 1.21 (6.00 – 10.00)	NS
Patient satisfaction score, %	91.85 ± 5.41 (90.00 – 100.00)	97.56 ± 6.62 (92.00 – 100.00)	<i>P</i> = 0.04

Data presented as mean ± SD (range).

^aχ²-test

NS, not statistically significant (*P* ≥ 0.05).

The average patient satisfaction score was also higher expressively in the last 29 patients compared to the 1st 31 patients (*p* = 0.04).

DISCUSSION:

Modern improvements in equipment's for laparoscopic surgery and improved surgical abilities have additionally increased the advantage of laparoscopic surgery over open surgery⁷⁻⁸. Several doctors have tried to decrease trauma to abdominal wall by reducing the ports size used for surgery or by reducing the trocars number. In the previous decade of laparoscopic surgery, few studies were printed, and several doctors think that this type of "challenging" surgery have desired benefit for patients and reduce scars. Cholecystectomy and Total laparoscopic thyroidectomy are extensively used in numerous surgical centers, and the idea of a less aggressive cosmetic technique has been acknowledged by various specialists and accepted by individuals⁹⁻¹⁰.

Advances in instruments of laparoscopic surgery and technologies have prompted further specialists to try this method¹¹. New strategies and instrumentation have reduced few difficulties encountered when doing laparoscopy through a single incision in the abdomen for various gynecological procedures. Gynecologists began to study TSPLH and developed a single port technique¹². A creative SPLS technique using typical instrumentation was to place a self-supporting ring collector in surgical gloves, in which 3 fingers were replaced and removed with a trocar. In gynecological surgery; Suturing is a communal practice and is difficult to do over a single port. When endoscopic sutures are needed, standard sutures can be performed by extracorporeal methods¹³. It has been planned to test the cutting and cauterization of the latest instruments, thus reducing the number of instrument replacements required. Simultaneous manipulations are necessary to ensure efficient operation and the sudden disappearance of the device. Although the surgeon needs a lot of experience in laparoscopic surgery to overcome these difficulties, it can somehow be solved with the help of progressive new instruments. These instruments are very inaccessible and expensive to specialists in under developed regions¹⁴.

In this study, double-sided self-closing sutures by stitching the cuff to the vagina were avoided. Although the interaction of the instruments during surgery can be overwhelmed by the skills of the doctor, this is a very important problem to solve. In this study, only one patient with TSPLH was converted to TLH (because of extensive inflammatory adhesion); therefore not possible to perform TSPLH practically. In both groups; no postoperative complications like incisional hernia was noted signifying that TSPLH has the identical safety level as of TLH.

A patient with uterine adenomyosis and multiple abdominal adhesions has undergone successful transvaginal NOTES hysterectomy without major complications and no conversion to conventional laparotomy or laparoscopy. We show that this technique, which combines NOTES with traditional colpotomy through the vaginal canal, can be used in patients with severe abdominal adhesion. Abdominal adhesions usually occur after abdominal surgery and can lead to obstruction of the small intestine, chronic pelvic pain, dyspareunia and more common complications in later operations. Laparoscopic adhesiolysis is widely used and has been associated with reduced overall complications, prolonged intestinal obstruction and pulmonary complications compared to open adhesion. However, laparoscopic adhesion or laparotomy can be time consuming and technically difficult due to the narrow surgical area of the fibrous bands. Therefore, NOTES have become a real and preferred approach for a patient with severe abdominal adhesions because surgeons can reach the pelvic cavity. The first case of vaginal laproscopic hysterectomy published by in 2012. A number of studies have been conducted to examine the techniques and feasibility of hysterectomy in patients with benign uterine disease, including complete vaginal hysterectomy. NOTES mentioned in earlier studies are the loss of triangulation, collision of instruments, and in particular the lack of a panoramic view of the pelvis when using the 30 ° endoscope. Patients with pelvic adhesions are relatively contraindicated for enucleation. NOTES, especially at impasse, due to the extended duration of surgery and a higher rate of complications. Baekelandt recently revealed that in selected cases in 2015. Assessment of pelvic adhesions may be possible using computed tomography or magnetic resonance imaging (MRI), which appeared as non-invasive methods before surgery. Pre-operative computed tomography and magnetic resonance imaging can help you decide on a surgical approach, facilitate proper preoperative planning and provide objective evidence to determine the need for adhesion. In addition, CT is particularly useful in diagnosing small intestinal obstruction or peritoneal inclusion cysts without the usual signs of peritoneal adhesion. One study also found that magnetic resonance imaging specificity in detecting pelvic adhesions reached 90%. Accuracy was highest at the front overhang with 88% of all adhesive areas. In this case, preoperative computed tomography was performed, which showed that the intestine was attached to the right posterior uterine surface. Another surgical discovery revealed intense adhesions in the area of the fundus without causing damage to the fundus sac, which makes this patient suitable for hysterectomy. It also prevents the deterioration of abdominal adhesions. Another

problem is vaginal length after hysterectomy. A prospective observational study showed a better sexual experience after full and partial vaginal hysterectomy by NOTES and there was no difference between them. The length of the vagina was not related to sexual function. One review found that women can be certain that hysterectomy does not adversely affect sexuality. Advantages of NOTES hysterectomy include the advantages of minimally invasive surgery, an invisible scar that prevents trocar wound complications and supports cosmetic results. The single-incision laparoscopic surgery potential benefits include shorter recovery time, reduced pain, less morbidity, excellent cosmetic effect and lower cost. The low threshold is important for careful case selection and transition to traditional laparoscopic surgery. Randomized, multicenter and prospective studies are compulsory to compare long and short-term results with conventional laparoscopic procedures after SPLS¹⁵. Although TSPLH takes more time than traditional laparoscopy, it is safe and feasible in our study. In the last 29 patients with TSPLH, the shorter operation time compared to the 1st 31 patients showed that the operation time was shortened as procedures improved. Other clinical trials should explain the effectiveness of SPLS.

CONCLUSION:

Although TSPLH is well acknowledged by patients who are concerned about the cosmetic effects of surgery, larger randomized controlled studies are needed to assess the safety and efficacy of this technique. Preliminary large-scale prospective randomized studies with long-term observations were needed to confirm these primary conclusions. In this study, the TSPLN procedure with vaginal sutures have few postoperative complications and they were confirmed to be fully recover.

REFERENCES:

- Mun, S.T. and Chung, S.H., 2019. 1478 Retrospective Comparison In Single Port Total Laparoscopic Hysterectomy Between Conventional Intracorporeal Barbed Suture and Vaginal Approach Barbed Suture. *Journal of Minimally Invasive Gynecology*, 26(7), p.S116.
- Brace, C., Burns, M., Thurston, J. and Rajakumar, C., 2019. Laparoscopic Single-port Subtotal Hysterectomy: Technique and Advantages. *Journal of Obstetrics and Gynaecology Canada*, 41(10), p.1409.
- Tsivyan, B.L., Puchkov, K., Konstantinova, E. and Vardanyan, S., 2019. 2859 Single-Port Laparoscopic Hysterectomy in Patients with Myoma Uteri. *Journal of Minimally Invasive Gynecology*, 26(7), pp.S103-S104.
- Johansson, C. and Chan, F., 2019. Robotic-Assisted vs Conventional Laparoscopic Hysterectomy for Endometrial Cancer. *Journal of Minimally Invasive Gynecology*, 26(7), pp.S74-S75.
- Wang, X. and Chen, Y., 2019. 1867 Transvaginal Single-Port Laparoscopic Hysterectomy for Large Uterus. *Journal of Minimally Invasive Gynecology*, 26(7), p.S205.
- Choi, H.J., Kim, M.S. and Kim, T.J., 2020. Uterine artery ligation at its origin following retroperitoneal space development decreases blood loss during single-port total laparoscopic hysterectomy. *Taiwanese Journal of Obstetrics and Gynecology*, 59(2), pp.262-268.
- Terzi, H., Biler, A., Turkay, U. and Kale, A., 2019. A comparison of novel laparoscopic suturing techniques in single-port surgery. *Minimally Invasive Therapy & Allied Technologies*, 28(6), pp.338-343.
- Lirk, P., Thiry, J., Bonnet, M.P., Joshi, G.P. and Bonnet, F., 2019. Pain management after laparoscopic hysterectomy: systematic review of literature and PROSPECT recommendations. *Regional Anesthesia & Pain Medicine*, 44(4), pp.425-436.
- Tyan, P., Robinson 3rd, J., Dandapani, M., Li, J., Gu, A. and Moawad, G.N., 2019. Novel Approach for 2-Port Laparoscopic Hysterectomy. *Surgical innovation*, 26(4), pp.442-448.
- Alletti, S.G., Perrone, E., Creti, A., Cianci, S., Uccella, S., Fedele, C., Fanfani, F., Palmieri, S., Fagotti, A., Scambia, G. and Rossitto, C., 2020. Feasibility and perioperative outcomes of percutaneous-assisted laparoscopic hysterectomy: A multicentric Italian experience. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 245, pp.181-185.
- Sinha, R., Bana, R. and Sanjay, M., 2019. Comparison of Robotic and Laparoscopic Hysterectomy for the Large Uterus. *JSL: Journal of the Society of Laparoendoscopic Surgeons*, 23(1).
- Weng, C., Chen, L.H., Chao, A.S. and Wang, C.J., 2019. 2363 Laparoscopic Management of Heterotopic Cornual Pregnancy-Tips & Tricks. *Journal of Minimally Invasive Gynecology*, 26(7), p.S104.
- Lee, C.Y., Tseng, C.J., Chang, C.H., Lee, M.C., Ou, Y.C. and Yang, S.F., 2019. Effect of modified laparoscopic hysterectomy on pelvic floor function: A retrospective observational study. *Medicine*, 98(8).
- Prodromidou, A., Spartalis, E., Tsurouflis, G., Dimitroulis, D. and Nikiteas, N., 2020. Robotic versus laparoendoscopic single-site hysterectomy: a systematic review and meta-analysis. *Journal of Robotic Surgery*, pp.1-8.
- Zhang, Y., Kohn, J.R. and Guan, X., 2019. Single-Incision Hysterectomy Outcomes With

and Without Robotic Assistance. *JSLs: Journal of the Society of Laparoendoscopic*

Surgeons, 23(4).