

Laparoscopic Hysterectomy by Pandit's 4S Technique: A Case Series of 3011 Patient

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Abstract: Hysterectomy is the commonest gynecological procedure performed. Laparoscopic hysterectomy has shown several advantages over laparotomy, including fewer infections, less postoperative pain, and faster recovery times as well as shorter hospital stay. This case series presented laparoscopic hysterectomy of total 3011 patients of various indications carried out by innovative technique (Pandit's S4 Technique) which is simple, safe as well as with minimum complications. The aim of this case series is to introduce an innovative technique for laparoscopic hysterectomy to the scientific community.

Keywords: Laparoscopy, Hysterectomy, Pandit's S4 Technique, Case Series.

INTRODUCTION

Hysterectomy is the commonest gynaecological procedure performed. Surgical advances have made hysterectomy to be performed in an ever less invasive manner. In 1988 first laparoscopic hysterectomy was conducted by Dr. Harry Riech[1]. Laparoscopic hysterectomy has shown several advantages over laparotomy, including fewer infections, less postoperative pain, and faster recovery time as well as shorter hospital stay[2]. Over the period of time many modifications as well as innovations has been done in the technique of laparoscopic hysterectomy.

The laparoscopic hysterectomy can be categorized into three main types including laparoscopic assisted vaginal hysterectomy (LAVH), laparoscopic supracervical hysterectomy (LSH), and total laparoscopic hysterectomy (TLH). Nowadays it has become a preferred choice amongst women who requires hysterectomy for benign gynecological conditions.

Recent advances in equipment, surgical techniques and training have made total laparoscopic hysterectomy a well-tolerated and efficient technique. It was increasingly being adopted around the world because of the benefits to the patients and surgeons [2]. As per review article published by Elkington and Chou only a few surgeons performing total laparoscopic hysterectomy have published their techniques and results. As more surgeons became trained in advanced laparoscopic surgery, the role of total laparoscopic hysterectomy will increasingly take over indications for total abdominal hysterectomy. It remains important that surgeons share their experience and publish their techniques, results and complications. Advanced laparoscopic training and supervision were paramount before embarking on total laparoscopic hysterectomy, so that complications were minimized [2].

This case series aimed at introducing an innovative technique of total laparoscopic hysterectomy with standardized steps evolved in our institution which we found as safe, less time consuming and with minimum complications as well as reliable.

MATERIALS AND METHODS

This retrospective study was conducted at Private multispecialty hospital in Pune city. A retrospective data analysis was done, of all patients (n=3011) who underwent total laparoscopic hysterectomy from January 2005 to June 2016, which is more than a period of decade.

The important variables considered for study were age of the patient, Body Mass Index (BMI), indication for surgery, any co morbid diseases, any

previous surgeries and surgical history, intra-operative observations, postoperative observations, any complications, total operative time and total hospital stay.

Inclusion criteria were as follows

Patients who have good physical conditions and have no reproduction requirement; Patients with uterine myomas or endometrioma; Patients with abnormal uterine bleeding; adenomyosis Patients with benign uterine diseases determined by preoperative detection of tumor markers such as alpha-fetoprotein (AFP), carcinoembryonic antigen (CEA), carbohydrate

antigen (CA) 125, CA 19-9, and lactate dehydrogenase (LDH); and Patients who receive no hormone therapy in the recent 3 months.

Exclusion criteria were as follows

Patients who were contraindicated to laparoscopic surgery; Patients with suspicious malignant gynaecological disease diagnosed by ultrasound or MRI; and Patients with cervical cancer diagnosed by PAP TEST and malignant endometrial lesions diagnosed by diagnostic curettage. Table No. 1 summarizes the list of indications for laparoscopic hysterectomy

Table-1: Indications for Laparoscopic Hysterectomy (n=3011)

Sr. No.	Indications	Frequency (%)
1.	Leiomyoma	1006 (33.41)
2.	Abnormal Uterine Bleeding	828 (27.50)
3.	Endometriosis	673 (22.35)
4.	Ademoyosis	504 (16.74)
	Total	3011 (100%)

Preoperative workup

Patients were thoroughly evaluated with relevant preoperative work up for hysterectomy and assessment of anaesthesia risks. Pap smear, endometrial sampling and ultrasound investigation ruled out malignancy. No cases were excluded on the basis of uterine size and mobility. Preoperative preparation included a written informed consent, counselling with respect to oophorectomy, need for conversion to laparotomy and complications.

Bowel preparation

We had given Soft diet on day minus 2 of surgery soft diet no milk and milk preparation and activated Dimethicon 40 mg 2tabs TDS & Bisacodyl 5 mg 2 Tabs HS orally. Day minus one Liquid diet again no milk and milk preparation plus Activated Dimethicon 40 mg 2 tabs TDS and Bisacodyl 5 mg 2 Tabs HS and NBM after 10 MN.

Surgical Procedure in details

Position of the patient

Under General Anaesthesia Patient was placed in supine position & catheterisation of bladder done. Painting and draping were done. In some of the patients head low position was required especially in fatty patients.

Entry

Supraumbilical Entry- Umbilicus was held with tooth forceps and skin incision taken supraumbilically. Subcutaneous fat was dissected over the umbilical tube then facing the knife downwards incision was taken over umbilical tube which was then extended with the help of

curved artery forceps, peritoneum was still intact which was entered with Hassan's trocar. Then under vision accessory trocars were placed. Left lower trocar 1 – 2 cms above the anterior superior iliac spine in the line of primary trocar. Left upper port parallel to umbilicus in the midclavicular line. Right upper port parallel to umbilicus in the mid -clavicular line.

A stich is taken with 2'o ehtilon to appendages of mesosigmoid colon and with the help of port closure needle it is removed out from right side at the level of anterior superior iliac spine so that loop of sigmoid colon is pulled above the sacral promontary and POD is visualised easily also it doesn't allow the bowel loops to come towards POD.

Myoma screw fixation at fundus of the uterus from the right upper port while doing left side dissection. Cornual pedicles were coagulated with bipolar and cut with harmonic scalpel. Posterior leaf of Broad ligament was dissected up to uterosacrals and anteriorly bladder was dissected down and uterine artery with uterine pedicles were coagulated with bipolar and cut with harmonic. Mackenrods ligament was dissected with harmonic scalpel by continuously maintaining the traction on uterus with myoma screw and opening of vault at 8 O'clock position at the lateral fornix. Same steps repeated on the right side by placing the myoma screw from left upper port. The specimen was removed in Namaste position. Vault closure of 8 stitches on both angles and keeping 1 cm opening at the center of the vault which acts as a drain. No vaginal packing required, as vagina is a potential cavity and when thighs were approximated it holds back the carbon dioxide.

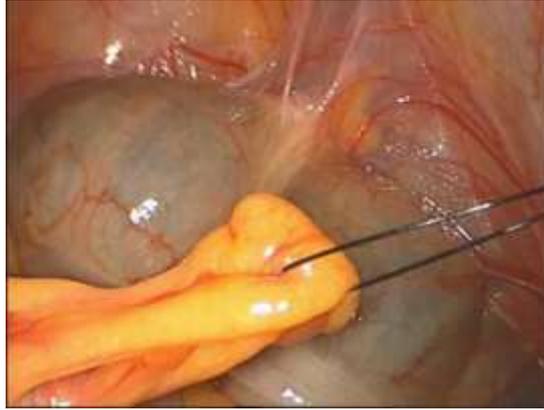


Fig-1: Stich to Appendages of Mesosigmoid colon



Fig-2: Fixing the myoma screw at the fundus



Fig-3: Dissection of Posterior leaf of broad Ligament



Fig-4: Specimen Retrieval

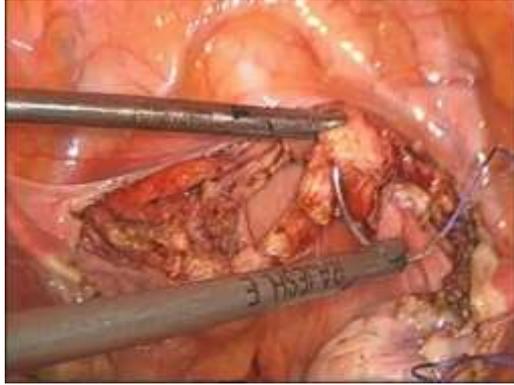


Fig-5: Vault Closure



Fig-6: Opening at the center after of 8 stich at angles



Fig-7: Uterine Pedicle Dissection



Fig-8: Namaste Position

Postoperative Management

Urethral catheters were routinely removed on the first postoperative day. Semi liquid diets were started 24 hours after the operation. Normal diets started according to the conditions of functional recovery of gastrointestinal function. Patients received anti-infective therapy for 3 consecutive days.

Clinical Assessment

All the patients were evaluated by detailed clinical history and physical examination. All patients underwent pelvic and kidney ultrasonography, blood count, and liver and kidney blood tests. The following parameters were evaluated: patient’s characteristics (age, weight, body mass index (BMI), parity, and previous surgical history), indications for hysterectomy, operation time, uterus removal time, length of hospital stay, blood loss, uterine weight, and intra- and postoperative complications. Operative time was calculated from the insertion of the trocar to skin closure of the last port site. Estimation of blood loss was made on the volume in the negative pressure suction bottles (mL).

RESULTS

Total 3011 patients were included in this present case series. The mean age of patients undergoing hysterectomy was 43.11 years (standard deviation =11.09 years). The average body mass index was 25.09 (standard deviation =9.09). 151 patients had a significant past medical history of hypertension (n=70), diabetes (n=34), hypothyroidism (n=11), chronic anaemia (n=28) and tuberculosis (n=8). 227 patients had a history of previous abdominal surgery like tubal ligation (n=52), appendicectomy (n=27), cholecystectomy (n=2) and lower segment caesarean section (n=148). Diagnostic laparoscopy was done in 18 patients.

The uterine size range was 100–950 g, with half of them were above 250 g. The minimum operative time was 20 minutes, with a mean of 65 minutes; no operation lasted more than 180 minutes. The blood loss range was 2ml–250ml, with a mean of 20 ml. It was observed that in patients with larger uterine sizes the blood loss was more compared to smaller uterine sizes.

Table-2: Important variables analysed

Sr. No.	Variable	Mean (S.D.)
1.	Age (in years)	43.11 (11.09)
2.	Body Mass Index	25.09 (9.09)
2.	Operative time (in minutes)	75.6 (27.9)
3.	Bleeding (in ml)	370 (90)
4.	Hospital stay (in days)	1.5 (0.7)

Complications

In the present case series, the complication rate was minimum. Intra operative complications were negligible (0.13%). Intra operative complications.

In the present case series, anaesthesia complications were occurred in 2 patients. In none of the patients vaginal manipulation was needed.

b. Postoperative complications:
Postoperative complications were also negligible (0.97%)

Table-3: Intraoperative Complications

Sr. No.	Name of Complication	Frequency
1.	Bladder Injury	3
2.	Bowel Injury	1
3.	Trocar entry injury	Nil
4.	Ureteric Injury	Nil

Table-4: Postoperative Complications

Sr. No.	Name of the Complication	Frequency
1.	Vaginal Infections	12
2.	Port site Infections	6
3.	Vaginal Bleeding	5
4.	Bladder Injury	2
5.	Vascular Bleeding	2
6.	Trocar site Bleeding	2
7.	Bowel Injury	Nil
8.	Ureteric Injury	Nil

In the present case series, only in two patients re-operative procedure was required. One bladder rift

was detected and sutured intra operatively and two cases of port site hematoma in the lower left quadrant of the

abdominal wall were detected some hours after surgery and treated with a compression bandage. One of these patients required a blood transfusion in one patient laparoscopic hysterectomy was converted to laparotomy. One woman returned to the hospital the same evening because of insufficient pain relief. There was no other readmission or recorded complication after discharge from the hospital.

Measurement of inter-ureteric distance

In the present study, after doing bilateral urethral stenting C arm images (Figure No. 9, 10) were taken in supine as well as lithotomy position. It was observed that inter-ureteric distance at different levels increases in supine position when compared with lithotomy position which is numerically as well as statistically significant ($p < 0.05$). This added advantage of more inter-ureteric distance was crucial in preventing ureteral injuries.

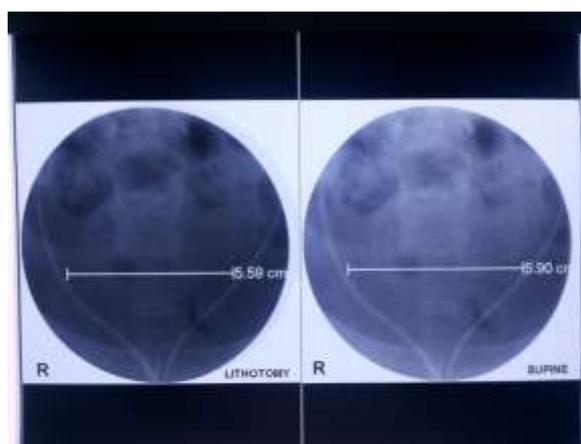


Fig-9: C Arm image at -----level

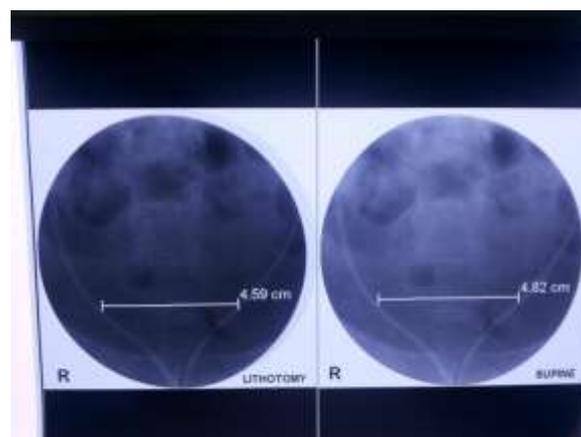


Fig-10: C Arm image at-----level

DISCUSSION

Approximately 30 years after its introduction, the use of laparoscopy in gynaecology has expanded from diagnosis and tubal sterilization to more sophisticated operations and is even being used for the management of malignancies. Despite rapidly improving technical equipment and surgical skill, complication rates and preventable injuries demonstrate a continuous pattern [3]. The actual incidence of complications possibly exceeds reported rates. Because levels of operative laparoscopy, study populations, and definitions of complications vary in different series, it is difficult to determine the exact incidence of complications. Also there/they may be bias in reporting, especially of minor complications. Delayed recognition and intervention adds to morbidity and mortality. Reported overall

complication rates were ranging from 0.2% to 10.3%. Major laparoscopic procedures are associated with a higher rate of complications compared with minor procedures, 0.6% to 18% and 0.06% to 7.0%, respectively [4].

The incidence of bowel injury is reported to be 0% to 0.5% [4]. Ureteral injury accounted for 4.3% to 7% of the total laparoscopy complications [5]. The most common type of urinary injury during laparoscopy is bladder perforation with an incidence of 0.02% to 8.3% [6]. The incidence of abdominal wall bleeding is 0.3% to 0.5% [7].

According to the previous reports published, uterus size above 12 gestational weeks suggests large

uterus[8,9]. A large uterus will lead to several surgical difficulties during laparoscopic hysterectomy, such as limited operative field, restrictive instrument range of motion, and difficult removal of the specimen. The large uteri are often associated with higher risk of complications and morbidities, such as prolonged operation time and excessive blood loss from retrograde bleeding [10–12]. In the present case series patients with large uteri as well as patients with co morbidities were managed well without any complications.

In the case series of 830 patients conducted by Katherine A. O'Hanlan et al, re-operative complications occurred in 38 patients (4.7%). Urologic injuries were observed in 23 patients (2.6%), with 9 (1.1%) requiring reoperation [13]. In case series Ng CC et al of 435 patients, injuries included bowel injury (four), bladder base bleeding (one), uterine perforation (one), uterovaginal fistula (one) and vaginal laceration (four). 21 women (4.8%) encountered major complications [14].

The present case series is unique case series with minimum complication rates. The surgical technique described in this case series can be summarized in the acronym as “4 S Technique” developed by experienced laparoscopic surgeon.

4 S meaning Supine, Supra-umbilical, Simple, and Safe. This technique is really simple as no extra training is required for practicing laparoscopic surgeon who is doing Traditional TLH as well as there is shorter learning curve for laparoscopic surgeon. Supra-umbilical is one of the safest entries in the abdominal cavity compared to entries by other sites. Supine position of the patient during the operative procedure have added advantages like it provides more space to operate, patient compliance is also satisfactory as well as no vaginal assistant is required during surgical procedure as well as supine position is better for coordination. As complication rates were on the lower side, this technique is safe for the patients.

In addition to above mentioned advantages, this technique also reduces operative time required as well as reduces number of assistants required during surgical procedure. In the present case series, overall complication was only 0.9% and urologic injuries were minimal.

CONCLUSION

This present case series which has more than 3000 patients over a period of more than a decade in which laparoscopic hysterectomy was carried out by developing unique technique (Pandit's S4 Technique) which is simple as well as safe and has complication free outcomes for various types of patients as well as indications.

Limitation of the study

Only hindrance for this innovative surgical technique was observed in unprepared bowels or in grossly obese and fatty patients.

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