

## LAPAROSCOPIC GYNAEC SURGERIES – A RETROSPECTIVE STUDY

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**ABSTRACT: BACKGROUND:** There has been a rapid worldwide adoption of laparoscopic procedures across many surgical specialties, most notably in Gynaecology. Unfortunately, the increased adoption of laparoscopic surgery has also been accompanied by a corresponding rise in the rates and types of complications reported. **AIMS:** To audit the different types of laparoscopic surgeries and their complications and comparison with other routes of surgery. **METHODS & MATERIALS:** We have retrospectively analysed 285 laparoscopic surgeries and 306 other routes of surgery which were done at our institute from July 2011 to April 2013. We admit the patients 1-2 days prior to surgery and a complete medical work-up of the patient is done for elective laparoscopic surgery. We defer laparoscopy for malignant conditions, uterine size more than 20 weeks, cervix flushed to the vagina or with history of more than 2 pelvic surgeries. Sub-fertile women, after an initial workup, are subjected to diagnostic laparoscopy with chromopertubation. For laparoscopic cystectomies, patients with ultrasonography findings suggestive of benign tumours are selected. **RESULTS:** We have performed 285 laparoscopic procedures over this time period till date. Majority of these cases are Laparoscopic Assisted Vaginal Hysterectomies (LAVH) [111 – 38.9%], followed by laparoscopic surgeries for various benign ovarian conditions (BOC) [62 – 21%] and Diagnostic Laparoscopies (DL) with or without laparoscopic ovarian drilling (LOD) [59 cases – 20.7%]. Out of 111 LAVH, 3 patients had bladder injury [2.7%]; Out of 285 cases that underwent laparoscopic procedures, 5 [1.75%] required conversion to laparotomy. Overall operative complications including major and minor, are significantly higher in the abdominal surgery group as compared to the laparoscopic group ( p value= 0.001) **CONCLUSION:** Laparoscopy is a safe route for conventional surgery, with lesser intraoperative, immediate post operative and delayed complications as compared to the abdominal approach.

**KEYWORDS:** Laparoscopy, LAVH, Ovarian Cyst, Endometriosis, Cystectomy.

**INTRODUCTION:** In the modern history of laparoscopy, the momentous transition from diagnostic to operative laparoscopic procedures accelerated following the first report of laparoscopic hysterectomy in the late 1980s<sup>1</sup>. Since then, there has been a rapid worldwide adoption of increasingly complex laparoscopic procedures across many surgical specialties, most notably in gynaecology<sup>2</sup>. Unfortunately, the increased adoption of laparoscopic surgery has also been accompanied by a corresponding rise in the rates and types of complications reported<sup>3</sup>. Major complications during laparoscopy are rare but can be catastrophic. Laparoscopic injuries can be minimized by adequate laparoscopic training, patient selection, and knowledge of pelvic anatomy and energy sources used.

Most vascular injuries occur during the laparoscopic entry phase, before the introduction of the Veres needle and primary port. Vessel lacerations have also been reported with the Hasson open entry and direct entry techniques.

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Laparoscopic surgeries present unique anaesthetic challenges which are not seen in open surgery. These include the effects of pneumoperitoneum, patient positioning, extra-peritoneal gas insufflations and venous gas embolism<sup>4</sup>.

We started doing laparoscopic surgeries at our institute from July 2011. We have performed 285 laparoscopic procedures over this time period till date. In this research study, we have made an attempt to retrospectively analyze the various laparoscopic surgeries and their complications that we have encountered as a beginner.

**MATERIALS AND METHODS:** We have performed 285 laparoscopic surgeries from July 2011 to April 2013. Over the same time period, a total of 417 hysterectomies were performed at our institute, out of which 111 were done by laparoscopic route. We have compared intraoperative, immediate post operative and late complications of laparoscopic assisted vaginal hysterectomies with other conventional routes of hysterectomies. However, there is no comparative data available for other laparoscopic surgeries like diagnostic laparoscopy, l ectopic resection, cystectomy and sterilization etc as laparoscopic route is the mainstay in the management of above conditions at our institute.

Institutional Ethical Committee approval was obtained retrospectively at the time of data collection .We admit the patients 1-2 days prior to surgery and a complete medical work-up of the patient is done for elective laparoscopic surgery. Laparoscopic approach for hysterectomy is decided for patients depending upon the pre-operative diagnosis, size of the uterus, cervical descent, previous pelvic surgeries and patient's desire. We defer laparoscopy for malignant conditions, uterine size more than 20 weeks, cervix flushed to the vagina or with history of more than 2 pelvic surgeries. Co morbid medical conditions like diabetes, systemic hypertension, heart disease, thyroid disease if any, are looked into and a cardiologist or physician's opinion is sought for the same. Pre-anaesthetic evaluation is done for all patients prior to surgery.

Subfertile women, after an initial workup, are subjected to diagnostic laparoscopy with chromopertubation. Laparoscopic Ovarian Drilling is done for polycystic ovarian disease (PCOD). Adhesions or associated pathologies are dealt with accordingly. Hystero-Laparoscopy is considered for subfertile patients with suspected uterine anomalies. We attempted Hysteroscopy guided Tubal Cannulation in few patients with proximal tubal blocks. We defer Chromopertubation or any surgical manipulation in patients with laparoscopic findings suggestive of Tuberculosis. In such patients, we take a peritoneal or omental biopsy along with pelvic fluid for further evaluation. Fertility potential in these cases is evaluated at a later date after completion of anti tubercular treatment.

For laparoscopic cystectomies, patients with ultrasonography findings suggestive of benign tumours are selected. Specimen retrieval is done in all cases either through the 10mm port or by colpotomy. We do not use the endobag routinely.

We attempt laparoscopic management of ectopic pregnancies only in patients who are haemodynamically stable. According to the patient's profile and intra-operative findings, a partial salphingectomy or salphingostomy is done.

Direct trocar entry is used routinely. However, in obese patients for diagnostic laparoscopy, Hasson open entry is used.

In the post operative period all patients are kept for observation and monitoring in the surgical intensive care unit. Post operative Hb and PCV is routinely done on the first post operative

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day. Routine IV antibiotics (cefotaxime and metronidazole) are continued for 48 hrs followed by oral antibiotics for 5 days for LAVH. For minor cases, IV antibiotics are given for 24 hours followed by oral antibiotics for 3 days. Foley's catheter is kept for 48hrs for LAVH and extended bladder drainage is considered in patients who required difficult bladder dissection during surgery. We defer urinary catheterization for minor laparoscopic procedures. All histopathology reports are routinely reviewed.

**RESULTS:** We started doing laparoscopic surgeries at our institute from July 2011. We have performed 285 laparoscopic procedures over this time period till date. Majority of these cases are Laparoscopic Assisted Vaginal Hysterectomies [111 – 38.9%], followed by laparoscopic surgeries for various benign ovarian conditions [62 – 21%] and Diagnostic Laparoscopies with or without laparoscopic ovarian drilling [59 cases – 20.7%]. [Table I]

On analyzing the trend of surgeries at our institute over this time period, it is quite evident that laparoscopy is increasingly being used and accepted by patients as a preferred route. [Table II, Figure I]

We have done 36 laparoscopic sterilizations [12.6%] during which we came across minor complications like hemorrhage at port site, a small hematoma in the mesosalpinx, and 2 cases of tubal avulsion, one with bleeding and another without bleeding. Hematoma in the mesosalpinx and port site bleeding were observed with no further complications. It is important to note that port site bleeding should be reinspected after release of pneumoperitoneum. Tubal avulsion without bleeding was managed by putting one extra Fallope ring and avulsion with bleeding was managed by partial salpingectomy using a bipolar cautery.

Out of 111 LAVH, 3 patients had bladder injury [2.7%], all being sustained during vaginal part of LAVH. All 3 were identified during the procedure and sutured vaginally using 3-0 delayed absorbable suture material in 2 layers. Continuous bladder drainage was done for 2 weeks in the post operative period. No sequelae were noted on follow up. We had significant hemorrhage from the uterine vessels in 3 patients during LAVH. Out of these, 1 patient required conversion to laparotomy. [Table III]

Out of 285 cases that underwent laparoscopic procedures, 5 [1.75%] required conversion to laparotomy, 4 being LAVH. One was due to severe hemorrhage; one was for intestinal mass, one for larger size of uterus which was difficult to deliver vaginally, one for bicornuate unicollis uterus with a thick lateral pedicle and one for broad ligament fibroid with hemorrhagic ovarian cyst adherent to the small bowel.

Out of 285 cases, we had 1 case of small bowel injury in a patient with suspected pedunculated fibroid. On Laparoscopy, a mass arising from the small bowel was noted, which was adherent to the uterus. Bowel injury was sustained in an attempt to separate the mass from the uterus. Subsequently, laparotomy was done with small bowel resection and end to end anastomosis. Post-operative recovery was uneventful and patient was discharged on post-operative day 20. The histopathology report came as Gastro Intestinal Stromal Tumour (GIST). Patient is presently on Imatinib therapy.

We performed 59 Diagnostic Laparoscopies for subfertility. Out of these, 15 patients showed evidence of polycystic ovaries and Laparoscopic ovarian drilling (LOD) was performed. Interestingly

one patient had disseminated tuberculosis, confirmed on peritoneal and omental biopsy. Presently she is on Anti Koch's treatment and is doing well.

We had 17 cases of haemodynamically stable ruptured Tubal Ectopic Pregnancies, in which laparoscopic management in the form of partial salpingectomy was done.

We have encountered 62 benign ovarian cysts which were managed by laparoscopic route in the form of cystectomies, salphingo-ovariotomies and cyst punctures for various ovarian pathologies. However, the exact numbers for the above procedures could not be obtained due to difficulty in tracing their medical records.

In our study, 7 bladder injuries (1.7%) were noted over a period of 2 years, out of which 3 were seen in LAVH, while the remaining 4 were seen in other routes of surgery. All were identified on table and bladder repair was done. In addition 3 ureteric injuries were noted, all in the abdominal hysterectomy group for large adnexal mass, carcinoma cervix and carcinoma ovary respectively. These injuries were identified post operatively. The difference was however not significant statistically (p value= 0.84) [Table IV]

Considering the immediate post operative complications, pyrexia was noticed in 3.6% of patients with LAVH. On the contrary, 8.8% of patients in the other group had significant post operative fever [Table V]. Immediate post operative complications like haemorrhage, wound sepsis, pain, urinary complaints were noticed in 1.8% of patients in the laparoscopic group as compared to 20.1% of patients in the other group.

Relaparotomy was done in 2 cases of abdominal hysterectomy and 5 cases were taken for wound resuturing. No such complications were noticed in the laparoscopy group. Vault exploration had to be done for 4 patients out of which 3 were following abdominal hysterectomies.

On analysis of major complications in hysterectomised patients from the time of discharge upto 6 weeks post op, 1 patient with abdominal surgery had Deep vein thrombosis, 4 patients had vesico vaginal fistula (1.3%) and 1 patient had uretero vaginal fistula (0.32%), 1 patient of vaginal hysterectomy had a vault granuloma on 6 weeks follow up. No patients in the LAVH group had any of the above complications on follow up [Table VI].

Overall operative complications including major and minor, are significantly higher in the abdominal surgery group as compared to the laparoscopic group (p value= 0.001)

**DISCUSSION:** According to the French collaborative study, operative laparoscopy includes minor procedures (minimal adhesiolysis, destruction of minimal endometrioses foci, ovarian biopsy, ovarian puncture, tubal sterilization), major laparoscopic surgery (extended adhesiolysis, tuboplasty, uterine suspension, treatment for ectopic pregnancy, salpingitis, ovarian cyst, moderate and severe endometrioses), and advanced laparoscopic surgery (hysterectomy, myomectomy, bladder neck suspension)<sup>5</sup>. In our series, we have not attempted myomectomy, bladder neck suspension, tuboplasty or any advanced laparoscopic procedure which involves endosuturing.

On analysis of our statistics, Laparoscopic Hysterectomy is the leading surgery followed by the surgery for benign ovarian conditions. This indicates that there is a significant demand for laparoscopy for the hysterectomy. We have stopped doing laparotomy for most ovarian pathologies except malignancies and large ovarian tumours.

It is now considered that laparoscopy is the gold standard for evaluation of subfertile women, as it allows assessment of pelvic anatomy<sup>6</sup>. Tubal patency can be confirmed, endometriosis

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can be treated and adhesiolysis can be done using laparoscopy. In cases of PCOD, Laparoscopic Ovarian Drilling can be performed<sup>7</sup>. The diagnosis of Genital Tuberculosis remains an enigma. Early Diagnostic Laparoscopy may be the only efficient tool to aid the evaluation<sup>8</sup>. Laparoscopic drilling of the ovaries is an alternative treatment for Polycystic Ovarian Syndrome in patients with Clomiphene citrate resistance. This involves a single procedure, which has minimal morbidity, which can lead to consecutive ovulations with minimal risks of multiple pregnancies.

A meta-analysis of medical versus surgical therapy for ectopic pregnancy indicated that laparoscopic surgery was the most cost-effective approach. Laparotomy is usually reserved for patients who are haemodynamically unstable or patients with cornual ectopic pregnancies<sup>9</sup>.

In managing benign ovarian cysts in adolescents and adults, laparoscopy is the preferred approach. In a study of 282 patients who underwent laparoscopic surgery it was concluded that the procedure is the first-line therapy for cysts<sup>10</sup>. The deflated, excised cyst wall can then be removed through one of the ports. In some cases, posterior vaginal colpotomy incision is used for removal of the intact cyst or cyst wall<sup>11</sup>.

Laparoscopic assisted vaginal hysterectomy (LAVH) is comparable to Total abdominal hysterectomy in terms of patients' benefits such as less blood loss, less analgesia use, reduced intra-operative and post-operative complication rates, less postoperative pain, rapid patient recovery and shorter hospital stay<sup>12</sup>.

In our study, out of 285 cases that underwent laparoscopic procedures, 5 [1.75%] required conversion to laparotomy<sup>13</sup>. The evaluate study concluded that although it could be considered that such conversions represent prudent surgery, it was felt that on the balance they represented a failure of planned procedure and should be considered as major complications<sup>3</sup>.

Out of 111 LAVH done in our series, 3 patients had bladder injury [2.7%], all being sustained during vaginal part of LAVH<sup>14</sup>. In Laparoscopic surgery, bladder is usually penetrated by the initial placement of Veres needle or trocar<sup>15</sup>. Most bladder injuries result from sharp dissection with or without cautery during LAVH<sup>14</sup>. Bladder injury is detected during surgery when gas fills up the urobag, blood stained urine in the urobag, fluid pooling in the pelvis/abdomen or by using methylene blue dye. Predisposing factors for bladder injury are midline lower abdominal trocar placement being the most common cause, followed by full bladder, endometriosis and distorted pelvic anatomy.

Urinary tract injuries are reported in approximately 1 percent of women who undergo pelvic surgery<sup>16</sup>. In our series, 2.3% of women had urinary tract injuries (7 bladder injuries, 3 ureteric injuries). On analysis of these, we noted that amongst the bladder injuries, 3 were in LAVH and 4 in the other group. In a study by Babak Vakili et al, there were 8 cases of ureteral injury (1.7%) and 17 cases of bladder injury (3.6%) There was no difference in the rate of bladder injury among TAH, TVH, and LH (2.5% vs. 6.3% vs. 2.0%, respectively;  $P = .123$ ), although there was a trend toward a higher incidence of bladder injury with vaginal hysterectomy<sup>17</sup>.

Amongst the 3 ureteric injuries in our series, all were noted in TAH done for adnexal mass or genital malignancies, while no such injuries were noted in the laparoscopic group. Vakili et al have also reported that abdominal hysterectomy was associated with a higher incidence of ureteral injury as compared to VH or LH (2.2% vs. 1.2% vs. 0%) but this was not significant.

On analysis of surgical fistulas, 4 patients had VVF (0.95%) and 1 patient had uretero vaginal fistula (0.23%). All fistulas were noted in abdominal surgeries and all patients presented with

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urinary leak 10-14 days post surgery. The contribution of surgical fistulas to the total fistula prevalence in developing countries is small, however it is often supposed that this complication results from direct injury to the lower urinary tract at the time of operation but this is certainly not always the result of careless, hurried, or rough surgical technique. In a study on Vesico-vaginal fistulas in developing countries, of the 165 urogenital fistulas over the last 12 years, 117 were associated with pelvic surgery, and 91 followed hysterectomies; of these only 4% presented with leakage of urine on the first day post operatively. In the other cases it was presumed that tissue devascularization during dissection, inadvertent suture placement, or pelvic hematoma formation or infection developing postoperatively resulted in tissue necrosis with leakage usually developing 5–14 days later. Over distension of the bladder postoperatively may be an additional factor in many of these latter cases. It is likely that patients with a habit of infrequent voiding, or those with inefficient detrusor contractility, may be at increased risk of postoperative urinary retention; if this is not recognized early and managed appropriately, the risk of fistula formation may be increased. The use of prophylactic catheterization in the first 24–48 h might be expected to reduce the risk of postoperative fistula formation, but this has never been proven<sup>18</sup>.

**CONCLUSION:** Laparoscopy is a safe route for conventional surgery, with lesser intraoperative, immediate post operative and delayed complications as compared to the abdominal approach.

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S. NO	SURGERY	TOTAL NUMBER
1	Laparoscopic sterilization	36
2	Diagnostic laparoscopy +/- †LOD	59
3	Rupture Ectopic	17
4	Dermoid cystectomy	13
5	Benign ovarian cystectomy	37
6	Endometriosis	12
7	☒ LAVH	111
TOTAL		285

Table 1: Type of surgery

☒ LAVH-Laparoscopy Assisted Vaginal Hysterectomy

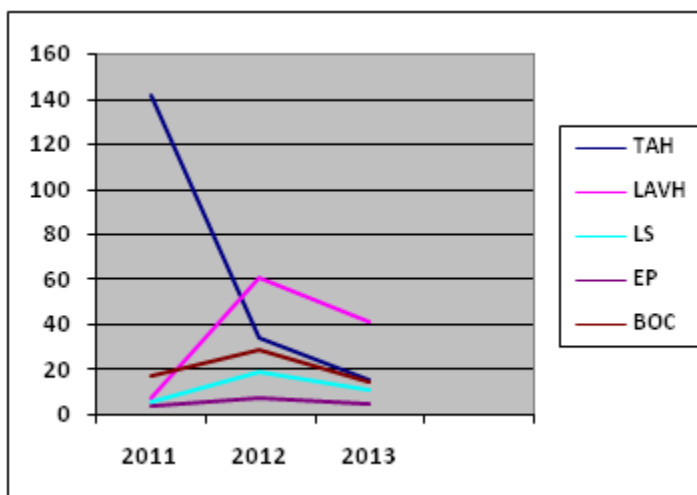
† LOD-Laparoscopic Ovarian Drilling

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S.No	Surgery	2011	2012	2013-Jan to June
1.	* TAH	142	35	16
2	†LAVH	8	61	42
3.	‡DL	20	24	15
4.	§LS	6	19	11
5.	EP	4	8	5
6.	**BOC	18	29	15

\* TAH-Total Abdominal Hysterectomy.  
 † LAVH-Laparoscopy Assisted Vaginal Hysterectomy.  
 ‡DL-Diagnostic Laparoscopy.  
 §LS-Laparoscopic Sterilization.  
 ||EP-Ectopic Pregnancy.  
 \*\*BOC-Benign Ovarian Cyst.

**Table 2: Trend of hysterectomies and other laparoscopic surgeries (September 2011 – June 2013)**



**Figure 1: Trend of hysterectomies and other laparoscopic surgeries (September 2011 – June 2013 )**

Sl. No	Type of surgery	Complications								
		Bowel injury	Urological injury			Haemorrhage			Conversion to laparotomy	Anaesthesia
			Bladder	Ureter	VVF	Major vessel	Port site	Operative site		
1.	Diagnostic	-	-	-	-	-	-	-	-	-
2.	LOD	-	-	-	-	-	-	-	-	-
3.	Adhesiolysis	-	-	-	-	-	-	-	-	-
4.	Ectopic pregnancy	-	-	-	-	-	-	-	-	-
5.	Ovarian cyst	-	-	-	-	-	-	-	1	-
6.	Laparoscopic sterilization	-	-	-	-	-	1	-	-	-
7.	Endometriosis	-	-	-	-	-	-	-	-	-
8.	Hysterectomy	1	3	-	-	-	-	3	4	-
Total		1	3	0	0	0	1	3	5	0

**Table 3: Complications of Gynaecological Laparoscopic Surgery**



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Hysterectomy & pt. no	Diagnosis	Haemorrhage with transfusion	Bladder injury	Bowel injury	Ureteric injury	Total
TAH/Subtotal						9 / 214
1.	DUB	-	Yes	-	-	
2.	Chr. cervicitis	Yes	Yes	-	-	
3.	Adenomyosis	Yes	-	-	-	
4.	Adnexal mass	Yes (3)		Yes	Yes	
LAVH						7/111
1.	Adenomyosis	-	Yes	-	-	
2.	Fibroid uterus	Yes	-	-	-	
3.	Adnexal mass	Yes	Yes	-	-	
4.	Adenomyosis	Yes	Yes	-		
5.	? Pedunculated fibroid	-	-	Yes	-	
VH/NDVH						2/86
1.	UVP	-	Yes	-	-	
2.	UVP	-	Yes	-	-	
Wertheim's						2/3
1.	Ca Cervix	Yes	-	-	Yes	
Staging Lap						2/3
1.	Ca Ovary	Yes				
2.	Ca Ovary				Yes	
Total No.		10	7	2	3	22/417(5.27%)

**Table 4 : Intraoperative complications**

Complication	Approach to hysterectomy					No of complications
	TAH	LAVH	VH/NDVH	Wertheim's	Staging laparotomy	
Pyrexia	25	4	2	Nil	Nil	31
Haemorrhage	3	Nil	4	Nil	1	8
Wound sepsis	9	Nil	Nil	1	1	11
Pain	12	2	Nil	1	Nil	15
Urinary complaints	8	Nil	3	1	Nil	12
Second laparotomy	2	Nil	Nil	Nil	Nil	2
Pulmonary Embolism	Nil	Nil	Nil	Nil	Nil	0
Death	Nil	Nil	Nil	Nil	Nil	0
Resuturing	5	Nil	Nil	Nil	Nil	5
Vault exploration	3	Nil	1	Nil	Nil	4
Total no of pts. With complication	67	4	10	3	2	88/417 (21.0%)

**Table 5: Immediate post operative complications**

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Complication	No. of occurrences
Pain	15(TAH) + 2(LAVH)
Poor wound healing	5(TAH)
Vault prolapse	1(TAH)
Bowel complaints	Nil
Deep vein thrombosis	1(TAH)
Femoral nerve injury	Nil
Vesico vaginal fistula	4(TAH)
Uretero vaginal fistula	1(TAH)
Vault granuloma	1(VH)
Total no of patients	30/417 (7.19%)

**Table 6: Complications from discharge upto 6 weeks post surgery**

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