



Research Article

CLINICAL AUDIT ON LAPAROSCOPIC HYSTERECTOMIES IN A SINGLE INSTITUTE PERFORMED BY A SINGLE SURGEON DURING THE DURATION OF FOUR YEARS

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ABSTRACT

Background and aim: This audit was done on 72 patients who booked themselves for laparoscopic hysterectomy and had the surgery performed during the duration of almost four years (November 2013 to September 2017) at Pushpawati Singhanian Research Hospital, New Delhi, India. Our aim was to adhere to recent evidence produced by the literature showing significant benefits of laparoscopic techniques for hysterectomy compared to the conventional ‘open’ approach. Benefits include decreased blood loss, shorter hospital stay, improved recovery and earlier return to normal activities with less abdominal wall infections.

With regard to NICE (National Institute for Clinical Excellence) guidelines 2007¹ our aim is:

1. All surgeons should have advanced laparoscopic skills – target 100%
2. Conversion to laparotomy should be <7%
3. Urinary tract injuries should be less than 1%
4. Duration of post-operative stay should be less than 2 days

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INTRODUCTION

Hysterectomy is one of the most commonly performed surgical procedures. Hysterectomy is performed for a variety of benign conditions that have not responded to conservative management, including heavy menstrual bleeding, symptomatic uterine fibroids, chronic pelvic pain and uterine prolapse. Hysterectomy is also performed for cancer of the uterus (including cervical cancer) and ovaries.²

A conventional “open” hysterectomy involves removal of the uterus through an abdominal or a vaginal approach. In total laparoscopic hysterectomy (TLH) and laparoscopic supracervical hysterectomy (LSH), the entire procedure is performed laparoscopically, including division of the uterine vessels. In TLH the cervix is removed, while in LSH it is left in situ. In laparoscopic assisted vaginal hysterectomy (LAVH) and laparoscopic hysterectomy (LH), part of the operation is performed laparoscopically and part vaginally. Uterine vessel division is performed vaginally in LAVH and laparoscopically in LH. (1)

When compared with abdominal hysterectomy (AH) and laparoscopic-assisted vaginal hysterectomies (LAVH), TLH has been reported to result in shorter procedure duration⁴, lower blood losses⁵, and shorter hospital stay.⁵

Table 1 AAGL Classification system for laparoscopic hysterectomy³

TYPE O	Laparoscopic directed preparation for vaginal hysterectomy
TYPE I	Occlusion and division of at least one ovarian pedicle, but not including uterine artery(ies)
TYPE II	Type I plus occlusion and division of the uterine artery, unilateral or bilateral
TYPE III	Type II plus a portion of the cardinal-uterosacral ligament complex, unilateral or bilateral
TYPE IV	Complete detachment of cardinal-uterosacral ligament complex, unilateral or bilateral, with or without entry into the vagina

Typically vaginal hysterectomy (VH) and LAVH are performed in patients with at least moderate prolapse usually associated with parity, but some of these patients may later develop vaginal prolapse or incontinence.⁶ Reported overall complication rates range from 0.2% and 10.3%.⁷ 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.⁷ Because some complications result from more than one cause, clear classification of complications is challenging. Complications include abdominal wall vascular injury, intestinal injury, ureteral injury, bladder injury, major vascular injury, hernia at trocar site, subcutaneous emphysema, hypercarbia, cardiac arrhythmia, pneumothorax/pneumomediastinum and port site metastasis. Hence, this audit was done to review the safety and efficacy of total laparoscopic hysterectomy by analysing the patient factors, indications, complications and postoperative hospital stay in all the patients who underwent

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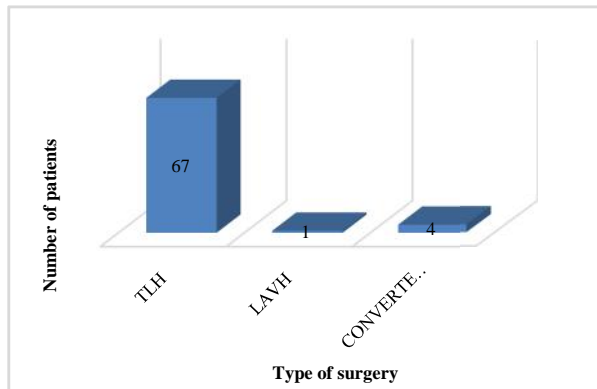
laparoscopic hysterectomies in the duration of almost 4 years in a single institute and operated upon by the same surgeon

METHOD

A retrospective review of all cases of laparoscopic hysterectomies including laparoscopic assisted vaginal hysterectomy (LAVH) and total laparoscopic hysterectomy (TLH) in PSRI Hospital, New Delhi was done during the duration of 4 years (2013-2017). Patient data was collected retrospectively from the patient records section. Patient demographics, intraoperative and postoperative complications, length of hospital stay was recorded and analysed.

Laparoscopic methods used

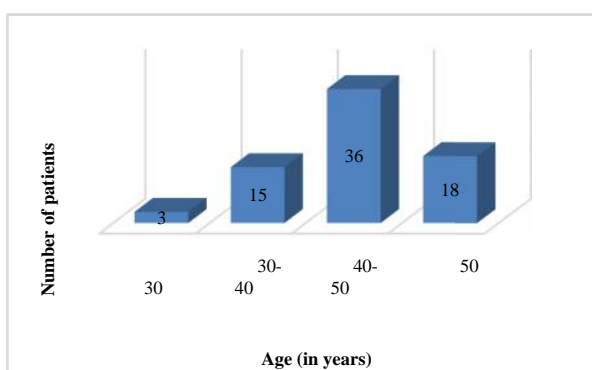
1. **Total laparoscopic hysterectomy (TLH):** The uterus and cervix is totally dissected laparoscopically and removed either through the abdominal wall with a morcellator or vaginally.
2. **Laparoscopic assisted vaginal hysterectomy (LAVH):** Comprises of an initial laparoscopic phase involving dissection of the uterus above the uterine vessels followed by a vaginal phase.



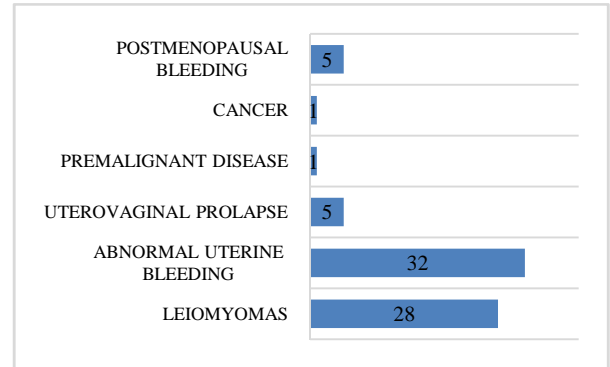
RESULT

Number of laparoscopic hysterectomies performed over during a 4 year period (2013-17)

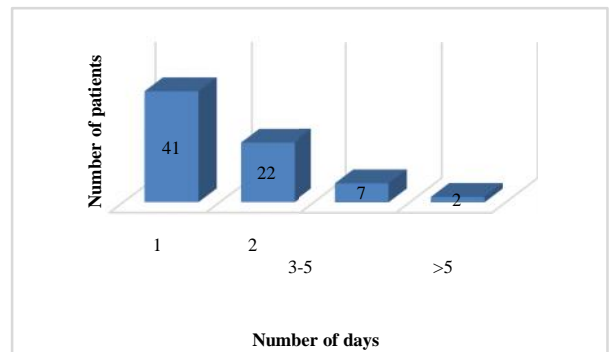
Complications	Standards or expected rate (referenced sources)	Audit
Conversion to laparotomy	2-7%	5.5%
Bladder injury	<1%	0%
Ureter injury	<1%	1.9%
Bowel injury	<1%	0%
Return to theatre (any cause)	<3%	0%
Mean hospital stay	<3 days	<2days
Readmission rate	<4%	0%



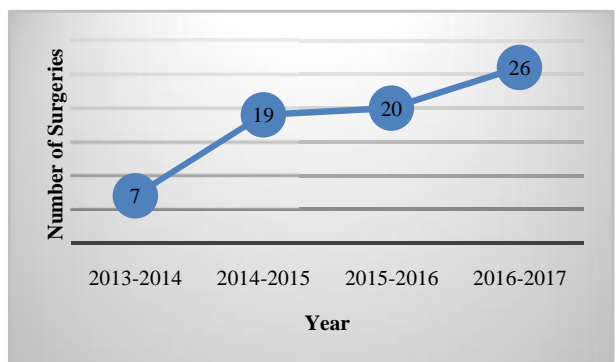
Age distribution of the patients



Patient indications



Duration of postoperative stay in hospital



Number of laparoscopic hysterectomies performed over the duration of 4 years

DISCUSSION

In this study, all the factors taken into account reflect a broad diversity of consecutive patients and demonstrate a broad utility for TLH. The number of women who underwent hysterectomy was maximum in the 40-50 years age group (36/72 or 50%) and the most common indication was abnormal uterine bleeding. The complication rate of 6.9% in this series are comparable to rates in other TLH series.⁸⁻¹⁰ Hoffman *et al*⁸ had a total complication rate of 10%, while Heinberg *et al*⁹ had a complication rate of 14.4% and Chapron¹⁰ reported complications in 10%.

One patient in our study had urological injury which was a ureteral injury during dissection in a case of severe endometriosis. Laparotomy was done followed by re-implantation with D-J stenting. Katherine *et al*¹⁷ reported urological injury in 2.3% (19 out of 830 patients), with half requiring reoperation: 3 cystoscopic ureteral stent placements,

4 ureteral re-implantations, and 2 laparotomies for closure of bladder fistula. Brummer *et al*¹¹ also reported that this incidence decreased from 1.4% to 0.7% between 2000 and 2005. Of all urinary injuries, 64.7% occurred with laparoscopic- assisted vaginal hysterectomy, 18.0% during operations for endometriosis, and 12.3% during diagnostic or sterilization procedures.¹²

Pelvic surgery is the most common cause of iatrogenic ureteral injury. It is becoming more common as a result of the increasing number of laparoscopic hysterectomies and retroperitoneal laparoscopic procedures that are being performed. The majority of patients with ureteral injuries have no identifiable predisposing risk factors. Estimated incidence of ureteral injury during laparoscopic hysterectomy is 2.6 to 35 times more common (0.2% to 6.0%) than in abdominal hysterectomy¹³. Ureteral injury accounted for 4.3% to 7% of the total laparoscopy complications.^{14,15} Overall ureteral injuries were identified with incidence rates ranging from 0.025% to 2%.^{15,16}

Laparoscopic repair is frequently used in cases recognized intraoperatively, while the laparotomy approach is performed in patients diagnosed postoperatively. Focal ureteral injuries can be treated using a double J-shaped catheter allowing for spontaneous healing. However, more extensive damage may require laparotomy to perform an end-to-end anastomosis or ureteral implantation. In delayed recognition of ureteral injury, initial treatment with ureteral stenting may not be useful, and early open repair (ureteral reconstruction, ureteroneocystostomy) for these injuries is advocated.

Of 72 women enrolled in the study, 4 were converted to open laparotomy. First one had enlarged uterus (28-30 weeks) with dense omental adhesions to the anterior abdominal wall extending from umbilicus to bladder plus patient could not tolerate head low with high insufflation, hence, laparotomy was done. Second patient also had multiple dense adhesions between uterus, omentum and anterior abdominal wall, probably due to history of previous 2 C-sections and endometriosis. Third patient had an enlarged uterus of about 32 weeks with dense adhesions due to previous abdominal surgery. In the fourth patient hysterectomy was completed laparoscopically but laparotomy had to be done due to ureteral injury for which ureteral re-implantation with DJ stenting was done.

Our conversion rate adheres to the NICE (National Institute for Clinical Excellence) guidelines conversion rate of <7%. The conversion rate was also comparable to other series, Katherine *et al*¹⁷ reported a conversion rate of 0.16%. 5 out of 830 patients were converted to open laparotomy due to massive lower segment fibroid in 3 patients and uncontrolled retroperitoneal bleeding in the other two. Celik *et al*¹⁸ reported a conversion rate of 1.6%. One out of 62 patients was converted to laparotomy due to enlarged uterus with history of previous C-section.

In contrast to these findings, Sokol *et al*¹⁹ reported that pelvic adhesions and previous laparotomy were correlated with an increased risk of conversion to open surgery during gynaecological laparoscopy. Leonard *et al*²⁰ reported that uterine width, lateral myoma and a history of abdominopelvic

surgery were significantly associated with laparoconversion in TLH patients.

Our study reported no case of intestinal injury, vascular injury, infections, wound healing problems or any other major complication. The incidence of intestinal injury is reported to be 0% to 0.5%²¹. Injuries involving the inferior epigastric vessel are the most common type of vascular complication. The incidence of abdominal wall bleeding is 0.3% to 0.5%.^{11,21}

Due to retrospective nature of the study precise duration of the postoperative stay in hours could not be calculated. In our study, 88% of the patients were discharged in <2 days with 57% (41/72) discharged on postoperative day 1 and 30.6% (22/72) on postoperative day 2. NICE guidelines 2007 recommends the postoperative stay to be <3 days and our study had the average of <2 days. Katherine *et al*¹⁷ also reported an average hospital stay of <2 days. In a study done by Jayashree *et al*²², the duration of stay in the hospital was shorter for the women undergoing TLH, mean duration being 3.74 days as opposed to 5.85 days in women undergoing VH (Vaginal hysterectomy). In the study done by V DaCosta *et al*²³ they found that although not significantly different, patients in TLH group tended to spend on an average a shorter duration of time in hospital.

CONCLUSION

Total laparoscopic hysterectomy when performed by a trained and experienced surgeon in a good hospital set up offers minimal complication rates and shorter postoperative hospital stay. Thus, the technique of laparoscopic hysterectomy appears as a safe and effective approach towards a patient requiring hysterectomy, plus it also provides excellent access to the entire abdomen as needed in cancer surgeries, for patients with pelvic masses, endometriosis, pain or adhesions with minimal morbidity.

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