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# Initial Experience of Laparoscopic Management of Apparent Early Endometrial Cancer

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## ABSTRACT

**The traditional treatment for endometrial cancer is a staging laparotomy. In patients with apparent early stage disease, laparoscopic assisted vaginal hysterectomy has been employed as an alternative. We present a retrospective uncontrolled case series of 16 cases with apparent stage 1 endometrial cancer from November 1994 to April 2001 managed by laparoscopic assisted surgical staging (LASS) at the Gynaecological Oncology Department, KK Women's and Children's Hospital, Singapore. We have analysed outcome measures in terms of intra-operative complications, surgical morbidity and length of hospital stay, and have evaluated treatment success in terms of conversion to laparotomy, recurrent disease and mortality. Our findings indicate that LASS is a viable option in selected patients with apparent early endometrial cancer. Our initial experience with this modality of treatment thus proves that it has great potential in both treatment success and reduction of surgical morbidity. A larger case controlled trial would be ideal in order to substantiate these benefits.**


**Keywords: endometrial cancer, early stage laparoscopy, laparoscopic staging, laparoscopic assisted vaginal hysterectomy**

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## INTRODUCTION

The treatment and staging for endometrial cancer has undergone many changes over the past two decades. Since 1988, endometrial cancer has routinely been surgically staged. The traditional approach for staging as well as treatment was by laparotomy, to perform a total hysterectomy with bilateral salphingo-oophorectomy, obtain peritoneal washing, as well as remove pelvic and para-aortic lymph nodes for high-risk patients.

In a selected group of patients with apparent early stage endometrial cancer, vaginal hysterectomy was employed because of the lower surgical morbidity. It was often used as an alternative to the abdominal approach for high-risk patients as well as for the morbidly obese patients. However, there were limitations in the vaginal approach. These included the inability to explore the peritoneal cavity, obtain peritoneal cytology and perform lymph node resection. In addition, bilateral salphingo-oophorectomy was also more challenging when done vaginally. These limitations resulted in patients being understaged in up to 22% of reported cases[1].

With the minimally invasive approach, laparoscopic hysterectomy combined with lymphadenectomy can overcome these limitations. It avoids the morbidity of a laparotomy and at the same time provides adequate pathological information for an accurate surgical staging. Childers and colleagues were among the first to report the use of laparoscopic surgery for management of endometrial cancer in 1992[2].

Over the years, many more patients with early endometrial cancer have been surgically staged and managed with laparoscopic surgery. The common advantages in this mode of treatment were a reduction in patient's recovery time, need for analgesia, hospital stay and hospital charges.

At the Gynaecological Cancer Centre of KK Women's & Children's Hospital, cancer of the endometrium is the second most common gynaecological cancer encountered. Over 100 cases were managed in the year 2000. This paper describes our initial experience in using the laparoscopic assisted staging surgery (LASS) for the treatment of early endometrial cancer.

## METHODOLOGY

From November 1994 to April 2001, 16 nonconsecutive patients underwent LASS for apparent early stage endometrial cancer.

All patients who underwent this procedure had histological diagnosis obtained via dilatation and curettage or at least an endometrial pipelle sampling. The selection criteria of patients for LASS were as follows:

- clinical stage 1 disease
- endometrioid carcinoma

- cytological grade 1 or 2.
- a mobile uterus not more than 12 weeks in size.
- no conventional medical contra-indications to laparoscopic surgery.
- informed consent obtained after detailed counselling regarding the options of laparoscopy and laparotomy .

Preoperatively, a complete history was done and a physical examination was performed. Preoperative investigations included routine blood tests, chest X-ray and pelvic ultrasound or pelvi-abdominal CT scan. Bowel preparation consisted of two doses of Oral Fleet the day before operation.

Intraoperatively, the patients were placed in a modified lithotomy position using exenteration stirrups. Thromboprophylaxis was in the form of intermittent pneumatic compressors and prophylactic antibiotics were also given preoperatively. After the patient was put under general anaesthesia, a laparoscopic spoon was placed within the uterus for manipulation.

The surgical procedure (LASS) performed included:

- Laparoscopic exploration and peritoneal washings
- Laparoscopically assisted vaginal hysterectomy
- Bilateral salphingo-oophorectomy
- Bilateral pelvic lymphadenectomy.

Abdominal entry was established via an umbilical 10 mm port for the laparascope and two 5 mm ports on either side of the abdominal wall for manipulators. The operation began with an inspection of the entire abdominal-pelvic cavity. A sample of peritoneal fluid was then taken before proceeding to the pelvic lymphadenectomy. The pararectal and perivesical spaces were fully dissected and the surgical limits of intended dissection identified. The area of pelvic lymphadenectomy was outlined by the common iliac artery cephaladly, the psoas muscle laterally, the circumflex iliac vein and pubic bone caudally, the umbilical ligament medially, and the obturator nerve in its fossa inferiorly. The para-aortic lymph nodes were not sampled.

Following identification of the ureters, the infundibulopelvic ligaments were desiccated with bipolar electrodiathermy and divided. The round ligaments were similarly divided, the uterovesicle fold entered and the bladder dissected off the anterior uterine wall. After both uterine arteries were desiccated and transected, the rest of the hysterectomy was completed and the specimen delivered vaginally. An intraperitoneal drain and indwelling urinary catheter were also inserted before reversing the patient.

The patients were encouraged to start ambulating from the first postoperative day and diet was introduced gradually. After full ambulation and retention of diet was achieved, the urinary catheter was removed. The peritoneal drain was removed when the drainage was less than 50 mls per day and on the downward trend. Intravenous antibiotics were administered until the 5th postoperative day and analgesia was according to the patient's needs. Thromboprophylaxis came in the form of subcutaneous low molecular weight heparin (Fraxiparin) and thromboembolic deterrent stockings until full ambulation was achieved. The patients were discharged when the skin incisions were healing well and when they were fully ambulant, afebrile, retaining diet, and when postoperative pain was manageable.

**Table I. Distribution by age and body weight.**

| Age | Number of patients | Weight (kg) | Number of patients |
|---|---|---|---|
| 35 - 39 | 3 | 40 - 49 | 6 |
| 40 - 44 | 2 | 50 - 59 | 4 |
| 45 - 49 | 3 | 60 - 69 | 3 |
| 50 - 54 | 4 | 70 - 79 | 1 |
| 55 - 59 | 2 | 80 - 89 | 2 |
| 60 - 64 | 0 | | |
| 65 - 69 | 2 | | |
| **Total** | **16** | **Total** | **16** |

## RESULTS

The mean age of the patients was 49 years old (range: 34 to 66 years old). The mean body weight of the patients was 57kg (range: 41 to 82 kg). Table I shows the distribution of the age and body weight of the patients.

There were two complications encountered during surgery in our series. One patient had a bladder perforation during vaginal hysterectomy and another patient had extensive subcutaneous emphysema up to the level of her neck. The first patient recovered well after her urinary catheter was removed on the 6th post operative day and the second patient required 24 hours monitoring in the intensive care unit, following which her emphysema subsided spontaneously.

Laparoscopic pelvic node dissection was carried out in all 16 patients. The number of lymph nodes harvested ranged from 10 to 29, with a mean and median of 18 lymph nodes. The time taken for the LASS ranged from 2.67 hours to 6.43 hours with a mean of 4.28 hours and a median of 4.03 hours.

Thirteen patients required only up to two days (maximum) of occasional parenteral analgesia, while two patients did not require any at all. Only two patients had fever after their operation. One had a low-grade temperature for five days while the other had a temperature of more than 38ºC for two days. In these two patients, systemic investigations failed

**Table II. Pre and post operation haemoglobin levels.**

| Patient | Pre Operation Haemoglobin (gm/L) | Post Operation Haemoglobin (gm/L) | Days between Haemoglobin assessment |
|---|---|---|---|
| 1 | 12.2 | 9.7 | 1 |
| 2 | 14.0 | 10.3 | 1 |
| 3 | 13.6 | 11.7 | 0 |
| 4* | 12.3 | 8.9 | 0 |
| 5 | 12.8 | 10.5 | 0 |
| 6 | 9.1 | 8.4 | 1 |
| 7 | 10.4 | Not done | – |
| 8 | 12.7 | 11.2 | 2 |
| 9 | 10.7 | 9.4 | 0 |
| 10 | 14.0 | 13.0 | 2 |
| 11 | 12.3 | 12.5 | 4 |
| 12 | 10.5 | Not done | – |
| 13 | 13.7 | 10.4 | 1 |
| 14 | 13.6 | 12.5 | 0 |
| 15 | 14.4 | 12.7 | 5 |
| 16 | 13.5 | 12.1 | 2 |

* required one pint pack cell transfusion

**Table III. Number of lymph nodes harvested, duration of surgery and duration of post-operative stay tabulated according to chronological order (earliest to-date).**

| Patient | Number of Lymph Nodes | Duration of Surgery (mins) | Days of Post-Op Hospital Stay |
|---|---|---|---|
| 1 | 21 | 312 | 5 |
| 2 | 22 | 160 | 3 |
| 3 | 13 | 287 | 4 |
| 4 | 29 | 341 | 3 |
| 5 | 20 | 250 | 10 |
| 6 | 23 | 266 | 7 |
| 7 | 16 | 343 | 6 |
| 8 | 15 | 233 | 8 |
| 9 | 14 | 200 | 6 |
| 10 | 19 | 207 | 4 |
| 11 | 10 | 210 | 6 |
| 12 | 17 | 282 | 4 |
| 13 | 18 | 232 | 4 |
| 14 | 20 | 386 | 9 |
| 15 | 18 | 200 | 6 |
| 16 | 14 | 216 | 6 |

**Table IV. Histology at D&C and after LASS.**

| Histopathology | | Surgical & Cytological Grade | | | |
|---|---|---|---|---|---|
| At D&C | After LASS | After LASS | | | |
| 16 patients: Endometrioid adenocarcinoma | 15 patients: Endometrioid adenocarcinoma | | **G1** | **G2** | **G3** |
| | | **1A** | 4 | 2 | 0 |
| | | **1B** | 4 | 0 | 1* |
| | 1 patient: Synchronous Endometrioid adenocarcinoma of the uterus and ovary (stage 1A) | **2B** | 1 | 0 | 0 |
| | | **3A** | 1 | 2 | 0 |
| | | **3C** | 1 | 0 | 0 |

* Grade 3 from positive lymphvascular spread with focus of poorly differentiated cancer.

to find any evidence of a source of infection. There was also no wound infection, urinary tract infection, urinary retention or vaginal vault haematoma encountered in our series.

Fourteen of the 16 patients had post operative haemoglobin assessment and only one patient required one pint of pack cell transfusion. Except for four patients, the difference in haemoglobin levels pre and post surgery, was less than 2.5 g/dl. Table II reveals the haemoglobin assessment of the 14 patients.

Thirteen patients stayed for seven days or less after the operation with six patients going home on the 3rd and 4th postoperative day. The remaining three patients had hospital stays of between eight and 10 days. The first patient stayed for eight days because of a bladder perforation requiring an indwelling urinary catheter for six days. The second patient stayed for 10 days because of haematuria that developed five days after her operation. The urinary catheter was later removed one week after discharge from hospital and there were no further complications. The last patient stayed for nine days because of persistent serous secretion from the peritoneal drain site after it was removed on the 4th post operative day. The secretion finally ceased on her 9th postoperative day. It was deemed to be lymphatic drainage.

The number of lymph nodes harvested, duration of surgery, duration of post-operative stay tabulated according to experience by chronological order (earliest to-date) are shown in Table III. The final surgical stages of the cancers, based on the FIGO 1988 Staging criteria, were as follows:

Stage 1 - 11 patients
Stage 2 - 1 patient
Stage 3 - 4 patients

Table IV correlates the histology, surgical stage and cytological grade of the carcinoma diagnosed preoperatively and after LASS.

**Adjuvant Therapy and Follow-up**

Nine of these patients did not require further adjuvant therapy for their endometrial cancer while the remaining seven patients had adjuvant radiotherapy, namely:

- two had vaginal vault brachytherapy
- five had standard external beam pelvic radiotherapy and vaginal brachytherapy

The outcome of the patients on follow-up is tabulated in Table V.

One patient was lost to follow-up and 10 patients were followed up for 20 to 60 months. The remaining five patients only underwent their operation within the last 12 months and are still under review.

There were two unrelated deaths identified in our series. One patient developed primary cholangiocarcinoma nine months after surgery and succumbed to the disease. A review of this patient's operation showed that there were no obvious liver or gallbladder abnormalities noted at the time of LASS. A second patient developed primary pulmonary adenocarcinoma diagnosed by CT guided lung biopsy. She subsequently underwent thorocotomy and carcinomatosis pleura was found. Talc pleurodesis was performed and the final histology revealed adenocarcinoma of the lung, not typical of an endometrial origin. There was no port-site metastatic cancer encountered in our series.

**Table V. Outcome and follow-up of patients.**

| Patient | Duration of Follow-up (months) | Status |
|---|---|---|
| 1 | 63.8 | Well |
| 2 | 64.8 | Well |
| 3 | 59.2 | Mild LL oedema |
| 4 | 10.6 | Defaulted |
| 5 | 46.9 | Well |
| 6 | 28.3 | Lung Cancer |
| 7 | 43.4 | Well |
| 8 | 35.9 | Well |
| 9 | 29.3 | Well |
| 10 | 20.2 | Well |
| 11 | 20.7 | Well |
| 12 | 8.7 | Cholangiocarcinoma |
| 13 | 4.0 | Well |
| 14 | 1.5 | Well |
| 15 | 0.4 | Well |
| 16 | 0 | Well |

## DISCUSSION

Only two main procedures are considered as requirement for primary surgical management of endometrial cancer: hysterectomy and lymphadenectomy.

### Hysterectomy

In patients with early endometrial cancer, vaginal hysterectomy has been considered as effective therapy when compared to abdominal hysterectomy. In addition to fewer complications and morbidity, the five-year survival rate of 93-95% is also comparable to the traditional staging laparotomy and hysterectomy[3,4].

Nonetheless, vaginal hysterectomy, though sometimes more desirable in the obese patient with medical problems, is still considered inadequate. The main criticism has been the inability to explore the abdominal peritoneal surfaces and remove pelvic lymph nodes when required. For this reason, some still prefer an abdominal approach.

There is now little dispute that simple hysterectomy can be carried out laparoscopically. Employing this technique in the treatment of early endometrial cancer thus avoids the caveats of the vaginal approach. Visual inspection with magnification from the laparoscopic camera allows a clear view of not only the abdominal and pelvic regions but also the upper omentum, liver and diaphragmatic surfaces.

### Benefits of laparoscopic hysterectomy

There has been increasing evidence to show that laparoscopic management of endometrial cancer can be carried out with similar survival but at a significant reduction in morbidity[5]. In particular, operative blood loss, number of blood transfusions, duration of urethral catheterisation and hospitalisation time were greatly reduced[6-8].

Our initial experience in laparoscopically assisted surgical staging of endometrial cancer revealed similar advantages in the post-operative period. Only one patient required blood transfusion and the majority of the patients required only minimal analgesia in the postoperative period. All our patients were ambulant one to two days after their operation. This was probably because of the small wound size and thus lesser postoperative pain of laparoscopic surgery, as well as the earlier return of gastrointestinal tract function attributable to minimal manipulation of the intestines.

Although four patients had longer-than-expected hospitalisation because of short term morbidity, there were no cases of thromboembolism, pulmonary atelectasis or systemic or wound infection. This may be attributable to strict pre- and post-operative thromboprophylactic measures, antibiotic prophylaxis as well as aggressive physiotherapy.

There were only six patients who were discharged four days or fewer after surgery. This probably reflects a high degree of vigilance during the initial postoperative recovery phase.

With all these benefits, whether treatment of endometrial cancer can be satisfactorily accomplished by laparoscopy therefore depends on the effectiveness of lymphadenectomy.

### Role of lymphadenectomy

Dargent and Salvat first described laparoscopic lymphadenectomy for gynaecological cancers in 1989[9]. Querleu et al followed in 1991 with the first series of laparoscopic pelvic lymphadenectomy in 39 patients with cervical cancer[10].

We concur with Dottino et al[11] that lymphadenectomy utilising the laparoscopic approach is cleaner and lymph node yield also appears more complete, because of the magnification of laparoscopic surgery and because of the ease of dissecting pelvic spaces under a positive pneumoperitoneal pressure.

Though the average number of harvested lymph nodes in our series was 18, this is by no means an assessment of the extent of disease or adequacy of clearance as the USA Gynecologic Oncology Group has never regarded node counts as an index of surgical adequacy, nor have node counts ever been reported for any surgical trials.

Para-aortic lymphadenectomy was not carried out in our series as we felt it was not indicated for these patients. Morrow[12] reported that positive para-aortic lymph nodes were found mainly in cases with ovarian damage and myometrium invasion of over 50%, features that were not evident in our series at the time of operation.

**Operative time**

It is evident that the average operating time in our series is longer than most quoted studies[13,14]. This is attributed to the learning curve of the surgeons. There were three cases with operating time of around five hours. One was attributed to our pioneer attempt and the remaining two due to need for extensive adhesiolysis before proceeding with the operation proper. The longest case took 6.3 hours to complete because of difficulty at vaginal hysterectomy. This patient had a narrow vaginal canal with a 12-week size uterus that had minimal descent. When these four cases were excluded, the average operating time was a reasonable 3.8 hours. Despite the long operative time, there were no cases that required conversion to laparotomy and no major complications encountered.

**Understaged disease and adjuvant treatment**

In our series, there were five cases (31%) where initial underestimation of the disease occurred. Three cases were diagnosed as stage 3A because of microscopic invasion to the tube and ovaries. One case was diagnosed as stage 3C because of a positive obturator lymph node and another case was staged as 2B because of endocervical stromal invasion. All of these cases had grossly normal looking pelvis at the time of laparoscopy. This demonstrates the importance of proper surgical staging for endometrial cancer. This is clearly illustrated by Girardi[15] who found that 25% of clinically staged Stage 1 patients were upstaged to Stage 3 after staging laparotomy and lymphadenectomy.

In the seven patients who required adjuvant treatment postoperatively, the laparoscopic approach enabled them to start treatment without the usual delay required for recuperation following a laparotomy. Furthermore the possible reduction of adhesion formation provided by a laparoscopic approach may also contribute to an improved gastrointestinal tolerance to radiation therapy.

## CONCLUSION

There are definite benefits in adopting LASS for the treatment of endometrial cancer. With improvements in technique and experience, we believe the operating time and morbidity can be reduced further. This will allow our patients to benefit further from the advantages of laparoscopic surgery in the treatment of early disease.

The Gynecologic Oncology Group has initiated a phase III randomised study of vaginal hysterectomy and bilateral salphingo-oophorectomy (BSO) via laparoscopy versus total abdominal hysterectomy and BSO plus pelvic and para-aortic lymph node sampling in patients with stage I or IIA, grade I-III endometrial cancer (GOG-LAP2). We eagerly await the result of this prospective randomised study as it may strengthen the role of laparoscopy in the management of early endometrial cancer.

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