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Laparoscopy for the treatment of women with endometrial cancer

腹腔鏡在子宮內膜癌治療上的應用

Objective. To evaluate the use of a laparoscopic approach for the management of endometrial cancer.

Design. Retrospective study.

Setting. Regional hospital, Hong Kong.

Subjects and methods. Individual medical records of patients with preoperative histological diagnosis of endometrial carcinoma from January 2000 to December 2001 were reviewed and the data analysed.

Main outcome measures. Success of laparoscopic-assisted surgical staging, intra-operative and postoperative morbidity, and length of hospital stay.

Results. Laparoscopic surgery was successful for 93.3% (28 of 30) patients. Two patients were converted to laparotomy. The mean operating time was 102 minutes (standard deviation, 16 minutes) and the mean operative blood loss was 280 mL (standard deviation, 137 mL). The mean hospital stay was 5 days (standard deviation, 2.3 days). The intra-operative and postoperative complication rate was 16.7%, including vaginal tear, injury to the inferior epigastric vessel, lymphocyst, and pulmonary embolism.

Conclusion. This study illustrated that a laparoscopic approach is feasible for endometrial cancer surgery and may be considered as the primary treatment modality in skilled hands. This approach should be offered to women with endometrial cancer without contraindications for laparoscopic surgery if experienced endoscopic surgeons are available. Prophylaxis for venous thromboembolism and the use of retroperitoneal drainage may be helpful in decreasing the perioperative morbidity.

目的：評估於子宮內膜癌手術應用腹腔鏡的可行性。

設計：回顧性研究。

安排：地區醫院，香港。

對象與方法：總結由2000年1月至2001年12月期間，在一所地區醫院進行術前組織學診斷的子宮內膜癌患者的病歷，並分析有關資料。

主要結果測量：腹腔鏡輔助下手術分期的成功率，術中和術後的發病率，以及住院時間。

結果：30名患者中，28名(93.3%)成功進行腹腔鏡手術。另兩名患者改為進行剖腹手術。手術平均時間為102分鐘(標準差，16分鐘)，平均失血量為280毫升(標準差，137毫升)，而平均住院時間為5天(標準差，2.3天)。術中和術後併發症率為16.7%，併發症包括陰道撕裂、腹壁下血管受損、淋巴囊腫和肺栓塞。

結論：本研究闡明於子宮內膜癌手術應用腹腔鏡是可行的，並且可以考慮作為有經驗醫生的主要治療模式。如果具豐富經驗的內窺鏡外科醫生參與治療，應為對腹腔手術無禁忌症狀的子宮內膜癌患者提供此治療方法。進行預防靜脈血栓的措施和使用後腹腔引流術，均有助減少術後發病率。

Key words:

Endometrial neoplasms;

Hysterectomy;

Laparoscopy;

Surgery

關鍵詞：

子宮內膜腫瘤；

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外科

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Introduction

Uterine cancer is the ninth most frequent cancer in women in Hong Kong, and the second most frequent gynaecological cancer. There were 315 new patients registered in 1999.¹ In the US, endometrial carcinoma is the most common gynaecological malignancy, with approximately 37 400 new cases and 6 400 deaths reported in 1999.² Fortunately, the majority of women with endometrial cancer

present at an early stage with disease limited to the corpus. Ninety-seven percent of cases arise from the endometrium. Traditionally, the mainstay of treatment for the majority of women with endometrial carcinoma has been total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAHBSO). Lymph node status is included in the 1988 International Federation of Gynecology and Obstetrics (FIGO) staging of endometrial cancer.³ Thus, lymphadenectomy should be included in the staging procedure. To date, there is no published prospective randomised study to determine the effect of lymphadenectomy on survival. However, a retrospective study from the US reported a possible therapeutic benefit of lymphadenectomy on survival.⁴ Other studies have shown that the added morbidity of lymphadenectomy at the time of TAHBSO was low.^{5,6} Homesley et al⁵ reported no increase in the complication rates for patients receiving radiotherapy after undergoing lymphadenectomy.

For decades, it has been proposed that vaginal hysterectomy was a potential, and at times, preferable route for hysterectomy for selected women with endometrial cancer for whom TAHBSO might be difficult or risky.^{7,8} The vaginal approach does not guarantee adequate adnexal management or thorough exploration of the peritoneal cavity and its contents, however. Moreover, lymphadenectomy cannot be easily accomplished by the vaginal approach. Theoretically, the addition of a laparoscopic procedure to vaginal hysterectomy could potentially correct these deficiencies.⁹ The first paper on laparoscopic hysterectomy for benign disease was published in 1989.¹⁰ An intra-abdominal approach for lymphadenectomy¹¹ made it possible to treat endometrial carcinoma according to the FIGO staging.¹²

Laparoscopic surgery for women with endometrial carcinoma was first reported by Childers and Surwit¹³ in 1992. Further reports addressed the advantages and feasibility of minimal access surgery in the staging and treatment of endometrial cancer. This study was initiated to review the surgical outcomes of Chinese patients who underwent laparoscopic management of endometrial cancer in a regional hospital in Hong Kong.

Subjects and methods

A retrospective review of patients undergoing preoperative histological diagnosis of endometrial carcinoma at the Department of Obstetrics and Gynaecology, Tuen Mun Hospital, from 1 January 2000 to 31 December 2001 was conducted. These patients had no clinical evidence of metastatic disease. The main determinant of the surgical approach was the availability of endoscopic surgeons at the time of operation. Patients with a history of multiple laparotomy or a history of laparotomy for peritonitis in which dense adhesions or bowel adhesions were anticipated, or patients with cardiopulmonary diseases who were contraindicated for laparoscopic surgery were excluded. Otherwise, the choice of laparoscopic approach was offered to all patients. Patients were informed about the possibility

of conversion to laparotomy. All patients accepted the offer of laparoscopic approach after counselling and informed consents were obtained.

The medical records of the patients were reviewed and characteristics of age, weight, parity, menopausal status, previous laparotomy, and medical condition were noted. Intra-operative details, including type of surgical procedure, estimated blood loss, operating time, intra-operative complications, and conversion to laparotomy were recorded. Details of the postoperative course, including length of hospital stay, use of analgesia, and major postoperative complications, and the histology report on the surgical stage and grade of disease and the lymph node yield were gathered.

Laparoscopic techniques

All operations were performed by two laparoscopic surgeons with experience of laparoscopic-assisted surgical staging (LASS). No bowel preparation was required. All patients received antibiotic prophylaxis (zinnacef and metronidazole). Patients were placed in the lithotomy position with legs elevated and supported by Lloyd-Davis stirrups during the operation. A urinary catheter was inserted into the bladder during the laparoscopy. An intra-umbilical incision was made and a pneumoperitoneum was created with a Veress needle. Intra-abdominal pressure was kept below 15 mm Hg. A 10-mm cannula was introduced into the subumbilical port using a closed method while two 5-mm cannulas were inserted lateral to the left epigastric artery using direct vision. Thorough inspection of the pelvic and peritoneal cavities was performed. With no evidence of extra-uterine spread of the disease, 0.9% saline was instilled into the peritoneal cavity. A 10-mm incision was made at the right lower quadrant lateral to the right epigastric artery. A Veress needle was inserted for collection of peritoneal washing. A 10-mm cannula was inserted and dissection and coagulation were performed using both monopolar and bipolar diathermy.

All patients underwent pelvic lymphadenectomy. The peritoneum overlying the iliac vessels was opened and the ureters and iliac vessels were identified. The obturator spaces were developed. The superior vesicle artery and the obturator nerve were identified. Lymphatic tissues on the anterior and medial aspects of the external iliac vessels from the bifurcation of the iliac vessel and the obturator fossa above the level of the obturator nerve were removed. Haemostasis was achieved by bipolar diathermy. The lymph nodes were removed via the 10-mm cannula over the right lower quadrant. When performing laparoscopic hysterectomy, the infundibulopelvic ligament was coagulated and cut. The uterovesical fold was incised with monopolar scissors and the bladder was caudally reflected. Both uterine arteries were coagulated. Completion of the hysterectomy was accomplished by vaginal ligation of the cardinal and uterosacral ligaments. The vaginal vault was closed with a continuous vicryl suture. Both uterosacral and cardinal ligaments were suspended to the vaginal vault. The pelvic cavity was then examined again laparoscopically with

Table 1. Patients' characteristics

Age (years)	
Range	28.0-72.0
Mean	52.7
SD	10.6
Weight (kg)	
Range	54.0-89.0
Mean	65.0
SD	10.0
Parity	
Nulliparous*	6 (20.0%)
Parous*	24 (80.0%)
Range	0-5.0
Mean	2.2
SD	1.5
Menopausal status	
Premenopause*	14 (46.7%)
Postmenopause*	16 (53.3%)
Previous laparotomy*	9 (30.0%)
No. of co-morbidities	
0*	21 (70.0%)
1*	6 (20.0%)
2*	2 (6.7%)
3*	1 (3.3%)

* These data are expressed as the number of patients with percentage in brackets

haemostasis carefully secured by bipolar diathermy if necessary. All 10-mm ports were closed in two layers with the rectus sheath closed.

Results

During the study period, 48 women were diagnosed with endometrial cancer by endometrial sampling alone or by hysteroscopy. Thirty women underwent LASS. The other women were excluded from the laparoscopic approach due to the unavailability of the endoscopic surgeons at the time of operation (n=16), intravenous drug abuse with a history of peritonitis and laparotomy (n=1), and carcinoma of the ovary and corpus requiring laparotomy (n=1).

Laparoscopic management was successful for 28 of 30 (93.3%) patients and the procedure was converted to laparotomy for two (6.7%) patients. The reason for conversion to laparotomy was dense adhesion. One patient with dense adhesion precluding visualisation of the operative field underwent conventional laparotomy with TAHBSO, peritoneal washing, and pelvic lymphadenectomy. The

other conversion was due to dense pelvic adhesions caused by pelvic endometriosis. This patient underwent TAHBSO and peritoneal washing. Pelvic lymphadenectomy could not be accomplished as a high operative morbidity was anticipated in view of the dense pelvic adhesions.

Table 1 illustrates the patients' characteristics. In this series, the age range of patients with endometrial cancer was large, from 28 to 72 years. Patients had a mean body weight of 65 kg. Twenty percent of patients were nulliparous. Thirty percent of patients had had a previous laparotomy, mainly for tubal ligation. The majority (70%) of patients were otherwise healthy with no concomitant medical problems. Concomitant medical problems were mainly hypertension and diabetes mellitus. One patient had ocular myasthenia gravis and one had renal impairment, although these conditions did not hinder the use of laparoscopy in the management of endometrial cancer. One patient had a history of carcinoma of the breast.

Table 2 illustrates the surgical outcomes of LASS. Laparoscopic lymphadenectomy was successful for 28 (93.3%) patients. One patient had lymphadenectomy done on the right side only due to dense adhesions on the left side. This was not counted as a failure of LASS but as one of two cases of incomplete staging. One patient had positive lymph nodes with stage IIIC grade 3 disease. Two patients had intra-operative complications, one of whom required morcellation of the uterus, which was complicated by a vaginal tear. The specimen was assembled and pinned before sending for histopathological examination, however, so this did not affect the histological interpretation of the myometrial invasion. The other complication was accidental avulsion of the left cardinal ligament, although it was later revealed that there was tumour infiltration making the tissue more friable.

The postoperative course is illustrated in Table 3. One patient had a prolonged hospital stay of 14 days because of vault haematoma and injury to the inferior epigastric vessels, leading to abdominal wall bruising requiring blood transfusion. The vault haematoma and the abdominal wall bruising spontaneously resolved. Two other cases of post-operative complications included abdominal wall abscess

Table 2. Surgical procedure and outcomes of laparoscopic-assisted vaginal hysterectomy and bilateral salpingo-oophorectomy and laparoscopic lymphadenectomy

Surgical procedure/outcomes	No. of patients
Type of procedure	
Laparoscopic-assisted vaginal hysterectomy and bilateral salpingo-oophorectomy	28 (93.3%)
Total abdominal hysterectomy and bilateral salpingo-oophorectomy	2 (6.7%)
Laparoscopic lymphadenectomy	28 (93.3%)
Open lymphadenectomy	1 (3.3%)
Intra-operative complications	2 (6.7%)
Conversion to laparotomy	2 (6.7%)
Estimated blood loss (mL)	
Mean	280
SD	137
Operating time (min)	
Mean	102
SD	16

Table 3. Postoperative course

Hospital stay (days)	
Range	3-14
Mean	5.0
SD	2.3
Intramuscular pethidine dose (mg)	
Range	0-300
Mean	61.7
SD	78.2
Postoperative complications	
No. of patients	3 (10%)

Table 4. Surgical stage and histology

Surgical stage/histology	No. of patients
Stage IA	5 (16.7%)
Stage IB	15 (50.0%)
Stage IC	5 (16.7%)
Stage IIB	1 (3.3%)
Stage IIIA	3 (10.0%)
Stage IIIB	1 (3.3%)
Grade 1	21 (70.0%)
Grade 2	5 (16.7%)
Grade 3	4 (13.3%)
Positive lymph nodes*	1 (3.4%)
Lymph node yield	
Range	3-42
Mean	22
SD	9

* 29 patients underwent pelvic lymphadenectomy

over the right lower quadrant port site for one patient, which was later drained, and one patient had a lymphocyst, which resolved with conservative management. This patient also developed a pulmonary embolism requiring anticoagulation. The surgical stage and grade are illustrated in Table 4. The majority of patients had stage IB grade 1 tumours. All patients had endometrioid adenocarcinoma except for one with endometrioid adenocarcinoma with squamous differentiation. The median follow-up was 15.5 months (range, 9-29 months). There has been no clinical evidence of recurrence or port site metastases and all patients are still alive.

Discussion

Laparoscopic-assisted vaginal hysterectomy has been used at the Department of Obstetrics and Gynaecology, Tuen Mun Hospital, to treat benign uterine or adnexal pathology since April 1995. Laparoscopic-assisted surgical staging started in mid-1999 and this retrospective study presents the experience to date. Limitations of performing LASS include obesity and decreased vaginal capacity. Obesity is a risk factor for endometrial cancer, however. While most of the patients described here were of average build, one patient was obese

at 89 kg. This is uncommon in the Chinese population, and LASS was successfully accomplished for this patient. Equally, unless the vaginal capacity is extremely small, LASS can still be accomplished. One patient in this series was a woman with no history of sexual exposure, but LASS was successfully performed.

Several studies have been published highlighting the surgical outcomes for laparoscopic management of endometrial cancer (Table 5).^{12,14-20} The results presented here are comparable to these studies. The rates of conversion to laparotomy and the complication rates were similar. In terms of operating times, however, these were better in the study described here. It is believed that the use of laparoscopy would lengthen the operating time,^{14,16,19,20} and that laparotomy would be quicker than laparoscopy. This review found that, in experienced hands, the operating time for laparoscopic surgery for endometrial cancer was shorter than in the other studies listed in Table 5. It is possible that the small body weight of Chinese contributed to the short operating time. A short hospital stay was achieved for these patients, with a mean of 5.0 days (standard deviation [SD], 2.3 days), which is comparable to the series by Lim et al¹⁸ (4.2 days [SD, 3.1 days]) and Langebrenke et al²⁰ (4.3 days [SD, 1.9 days]). The small surgical wounds generally means less postoperative pain, which was reflected by the low doses of analgesia required. This would be reflected by a better recovery after the operation.

Cancer management varies from centre to centre. The role of lymphadenectomy is controversial. Moreover, there are currently no reliable methods for preoperative identification of low- or high-risk patients. One patient had grade 1 disease that was stage IIIA with tumour spread to the fallopian tube at surgical-pathological staging. Not until the results of ASTEC (A Study of the Treatment of Endometrial Carcinoma) are available will the role of pelvic lymphadenectomy be defined.¹⁸ Lymphadenectomy possibly does not increase the surgical morbidity for patients. Homesley et al⁵ reported no increase in complication rates after radiotherapy for patients who had undergone lymphadenectomy compared with those who had been treated with hysterectomy and bilateral salpingo-oophorectomy alone. Moreover, patients with negative lymph node status may be spared adjuvant radiotherapy. Hence, lymphadenectomy was performed for all patients with endometrial cancer in this study, regardless of stage and grade—the average number of lymph nodes in these patients was 22 (SD, 9).

Table 5. Review of studies of laparoscopic-assisted surgical staging

Study	No. of patients	Operating time (min)	Conversion rate (%)	Complication rate (%)
Childers et al ¹²	59	-	13.6	5.1
Gemignani et al ¹⁴	69	206.9	4.3	5.8
Magrina et al ¹⁵	56	194.1	12.4	23.2
Eltabbakh et al ¹⁶	86	190.5	5.8	10.5
Holub et al ¹⁷	68	168.7	2.9	26.5
Lim et al ¹⁸	40	112.0	12.0	20.0
Malur et al ¹⁹	37	176.0	0	29.7
Langebrenke et al ²⁰	27	143.0	3.7	7.4
Present study	30	102.0	6.7	16.7

None of the patients who underwent LASS had routine retroperitoneal suction drainage. The use of retroperitoneal suction drainage following radical pelvic surgery for invasive gynaecological malignancy has undergone intense scrutiny during the past decade. The clinical effectiveness of external drainage has also been questioned. Benedetti-Panici et al²¹ conducted a randomised study comparing retroperitoneal drainage with no drainage after lymphadenectomy for gynaecological malignancy. These researchers concluded that prophylactic drainage of the retroperitoneum appeared to increase lymphadenectomy-related morbidity and postoperative hospital stay. They recommended that routine drainage following lymphadenectomy was no longer indicated when the retroperitoneum was left open. Patsner²² was also of the opinion that routine retroperitoneal drainage might be safely omitted for staging pelvic lymphadenectomy.

Routine prophylactic anticoagulation or special precautions for the prevention of deep vein thrombosis (DVT) was not given to the patients in this study. This was based on experience of the incidence of DVT in the Chinese population being low. A study by Chan et al,²³ however, showed that the incidence of DVT among Chinese women is similar to that of Caucasians. The previous low incidence of DVT in Chinese people is now believed to be an underestimation.

One patient had complications of both lymphocyst and pulmonary embolism. Two amendments have therefore been made to the operative preparation and technique in the Department of Obstetrics and Gynaecology at Tuen Mun Hospital, as follows:

- (1) all patients will have retroperitoneal suction drainage, as recommended by Thompson,²⁴ and
- (2) all patients will have a pneumatic pump over their legs during operation. Patients will be asked to wear elastic stockings postoperatively until fully mobilised. Early mobilisation is encouraged.

It is hoped that the likelihood of developing lymphocyst or a venous thromboembolic event can be reduced.

This retrospective study shows that LASS is feasible in the management of endometrial cancer. With the availability of skilled endoscopic surgeons and no contraindications for laparoscopic surgery, LASS could be an option for all women with endometrial cancer with no clinical evidence of metastases. The long-term outcome for patients undergoing LASS is not yet known, however, and it is too early to know whether survival will differ from that after open laparotomy and whether the recurrence rate might be related to the use of laparoscopy. Thus, a prospective, randomised comparison of LASS with open laparotomy approach with long-term follow-up should be performed.

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