# Survival Impact of Initial Surgical Approach in Stage I Ovarian Cancer

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**Background:** The aim of this study was to evaluate the impact on survival of initial laparoscopic surgery compared with conventional laparotomy in stage I epithelial ovarian cancer.

**Methods:** We conducted a retrospective study which enrolled all consecutive patients with stage I epithelial ovarian cancer between January 1984 and December 2006. Patients with a histological diagnosis of epithelial ovarian cancer who underwent laparoscopy were recruited if their cases were compatible with stage I (clinical or surgical) at initial exploration. The independent samples *t* test, chi-square test, log-rank and Cox proportional hazards model were performed.

**Results:** A total of 208 patients were enrolled, including 34 patients with initial laparoscopy and 174 with laparotomy. The median follow-up time for survivors was 65 (range, 2-276) months. The 5-year overall survival (OS) and recurrence-free survival (RFS) rates were 67.4% and 69.5% in the laparoscopy group, and 88.7% and 78.7% in the laparotomy group, respectively. The median time to recurrence was 14.5 (range, 2-67) months. In multivariate analysis, the initial laparoscopy approach posted significant adverse impacts on the OS (laparoscopy vs laparotomy, the hazard ratio [HR]: 3.52, $p = 0.009$) and the RFS (laparoscopy vs laparotomy, HR: 2.58, $p = 0.024$), while a higher substage (stage IB-IC vs IA, HR: 8.29, $p = 0.040$) was associated with only a worse OS, and its impact on the RFS was marginal.

**Conclusion:** An initial laparoscopy intervention and higher substage posted significant adverse effects on the prognosis in stage I epithelial ovarian cancer. Important precautions when using laparoscopy for adnexal masses, such as avoiding rupture, applying protection, and submitting frozen sections, are recommended.

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**Key words: ovarian malignant neoplasm, ovarian cancer, laparoscopy, laparotomy, substage**

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Malignant ovarian neoplasms represent 3% of all female malignancies, and are the fifth most common cause of death from all types of cancer affecting women and the second most common cause of death from gynecological cancer.[1] The American Cancer Society estimated that there were 22430 with newly diagnosed cases of ovarian cancer and 15280 deaths from ovarian cancer in 2007. In the 26th Annual Report of International Federation of Gynecology and Obstetrics (FIGO), 5-year survival rates for Stage IA to IC ovarian cancer were 83.4 to 89.6%.[2]

According to practical clincial guidelines around the world, the standard management of early invasive ovarian cancer is a complete staging laparotomy with/without adjuvant chemotherapy, while fertility preservation can be considered in selected patients.[3-6] It is widely accepted that laparoscopy can achieve a quicker recovery and shorter hospital stay in benign gynecologic situations without increasing surgical complications owing to the advance of laparoscopic instruments and practice. Minimally invasive laparoscopic procedures have extended the possibility to extensive surgical intervention. The feasibility and efficacy of initial laparoscopic primary surgical staging or that for initially incompletely staged ovarian cancer has been reported by several experienced teams.[7,8] Nevertheless, possible intraperitoneal tumor spillage, tumor extraction path or port-site metastasis, and hematogenous metastasis remain important concerns.[9,10]

It has been very difficult in clinical practice to conduct randomized clinical trials to compare whether the overall and disease-free survival for laparoscopy is equivalent to that for laparotomy in patients with stage I epithelial ovarian cancer. Thus the aim of our retrospective study was to compare the risk of death and recurrence of cancer between laparoscopy and laparotomy as the first surgical approach in defined stage I epithelial ovarian cancer.

## METHODS

We conducted a retrospective study to enroll all consecutive patients with stage I epithelial ovarian cancer from January 1984 to December 2006. Through a search of the disease code database (International Classification of Diseases of Oncology [ICD-O]), the surgery code of Taiwan National Health Insurance, and the Systematized Nomenclature of Medicine (SNOMED) code for all ovarian cancer patients receiving laparoscopic surgery for stage I ovarian cancer regardless of surgical code, 236 patients were identified. A total of 28 cases were excluded because of apparent stage IIC-IV ovarian cancer noted on initial laparoscopic findings (n = 16), upstaging to surgical stages IIC-IIIC within 12-19 days after initial laparoscopy (n = 4), non-epithelial histology (n = 3), borderline ovarian tumor (n = 2), and stage IIIC disease when presenting to our hospital after an initial laparoscopy at an outside hospital with a lag time 14-69 days (n = 3). Of these 208 eligible patients, the diagnosis was confirmed in 34 by initial laparoscopy and in 174 by initial laparotomy. Those receiving an initial laparoscopy without a documented removal intact in a retrieval bag or through a colpotomy were designated surgical stage IC when comprehensive staging was performed. In contrast, those cases were designated clinical stage IC if comprehensive staging was not performed.

Histological classification was performed essentially according to FIGO recommendations.[2] Patients were eligible if they had clinical stage I disease (without comprehensive staging procedures) or were histologically confirmed to have a surgical stage I tumor if their primary operation was in our hospital. Clinico-pathological variables collected for analysis included age, substage, grade of differentiation, initial surgical approach, intraoperative frozen section, comprehensive surgical staging procedure, treatment, chemotherapy, presence and date of recurrence, recurrence pattern (with or without port-site metastasis), and date of death or last follow-up.

A comprehensive staging procedure consisted of a thorough inspection and/or palpation of the abdominal cavity and associated organs, peritoneal washings, removal of the entire ovary and fallopian tube on the affected side, an omentectomy, systemic pelvic lymph node dissection, removal of enlarged or suspicious para-aortic lymph nodes, biopsy of any suspicious peritoneal lesions, and removal of the uterus and contralateral adnexa if retention of fertility was not appropriate or unnecessary. Adjuvant chemotherapy was recommended with risk factors such as grade 2 or 3 or substage IB/C disease, clear cell/undifferentiated carcinoma or at the individual physician's discretion. Generally, cases with surgical stage IA, grade 1 were observed after laparotomy

unless there was incomplete staging (n = 4) or fertility conservation surgery was performed (n = 1). Usually platinum-based regimens (cyclophosphamide and platinum or paclitaxel and carboplatin) of 3 to 6 courses were prescribed for adjuvant chemotherapy.

### Statistical analysis

Statistical analyses were performed using SPSS version 15 statistical package (SPSS Inc. Chicago, IL, U.S.A.). Comparisons of clinicopathological variables between the two initial surgical approaches were calculated by the chi-square test or independent t test when appropriate. Survival curves were plotted and tested with the Kaplan-Meier method using the log-rank test. Analyses of prognostic variables were performed using the Cox proportional hazards model and expressed as multivariate-adjusted hazard ratios (HR) with 95% confidence intervals (CIs). We used bivariate Spearman correlation coefficients to clarify the relationship of diverse categorical data. A two-tailed value of $p < 0.05$ was considered statistically significant.

## RESULTS

### Clinicopathological characteristics

A total of 208 patients were eligible for analysis, of whom 34 (16.3%) were initially treated by laparoscopy, and 174 (83.7%) by laparotomy. Of the 174 laparotomy patients, 131 cases had comprehensive staging procedures (124 immediate, 7 delayed), and 43 had incomplete staging. Of the 34 laparoscopy patients, 18 had comprehensive staging procedures (9 immediate, 9 delayed), and 16 had incomplete staging (Fig. 1). Of the 9 with immediate staging, 2 received laparoscopic comprehensive staging and 7 had an immediate conversion to laparotomy. The lag time from initial surgery to delayed surgical staging ranged from 8 to 60 days (mean $\pm$ SD = 21.3 $\pm$ 13.1).

Table 1 depicts the clinico-pathological characteristics of patients with Stage I ovarian cancer according to the initial surgical interventions. The mean age at the time of surgery was 47.5 years. Clear cell carcinoma was the most prevalent histological type (32.2%). The laparotomy patients were significantly older than the laparoscopy patients (mean age, 49.3 versus 38.9 years; $p < 0.001$). Because malignancy was not suspected, 47.1% of laparoscopy patients and 17.2% of laparotomy patients did not have a frozen section ($p < 0.001$). As a consequence, a higher proportion of patients had immediate staging (71.3% versus 26.5%; $p < 0.001$) in the laparotomy than the laparoscopy group. In 5 cases (3 laparoscopy, 2 laparotomy), the frozen section was benign but the final pathology showed frank malignancy. The distribution of comprehensive surgical staging (immediate or delayed) ($p < 0.001$) and grade of differentiation ($p = 0.01$) were also significantly different between laparotomy and laparoscopy. Twenty-five (86.2%) of the 29 patients not receiving adjuvant chemotherapy had stage IA or grade 1 disease, while 2 patients were discharged against medical advice.

### Outcome

The median follow-up time for all survivors was 65 (range, 2-276) months, 48.5 months (3-174.5) in the laparoscopy group and 67 (2-276) months in the laparotomy group. Overall, there were 44 recurrences, and the median time to recurrence was 14.5 (range, 2-67) months. The 5-year overall survival (OS) of those with recurrence was 33.8%. The 5-year OS and recurrence-free survival (RFS) rates were 85.4% and 77.2% for all patients; 67.4% and 69.5% in the laparoscopy group, and 88.7% and 78.7% in the laparotomy group. There were 4 port-site metastases, and the median time to recurrence was 9.5 months (range, 2-14). All 7 patients with stage IA disease in the laparoscopy group (3 with delayed surgical staging, 1 received chemotherapy; 4 clinical IA, 3 received chemotherapy) were alive without disease. Neither of the 2 patients (stage IC) receiving immediate comprehensive staging by laparoscopy and chemotherapy within 7 days had a relapse.

### Univariate analysis of prognostic factors

In univariate analysis, age, substage, the initial surgical intervention, port-site metastasis and recurrence had significant impacts on the OS, while the grade of differentiation was associated with marginal significance (Table 2). Likewise, substage, grade and differentiation, and type of initial surgical intervention also showed prognostic impacts on the RFS (Table 2). Stratified analysis based on time period is shown in Table 3. The differences in the 5-year OS between the different initial surgical intervention

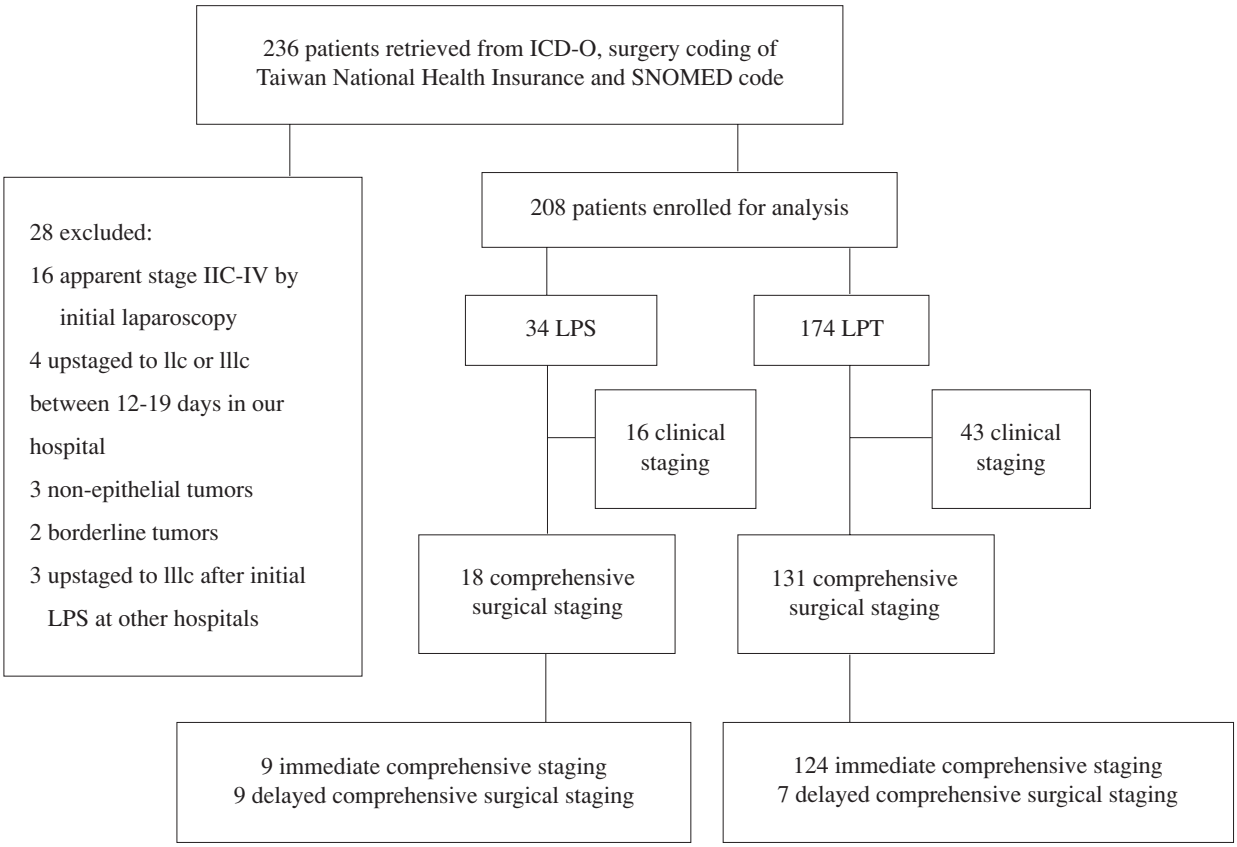


**Fig. 1** Flowchart of study patients. ICD-O indicates International Classification of Diseases of Oncology; SNOMED indicates Systematized Nomenclature of Medicine; LPS indicates laparoscopy; LPT indicates laparotomy.

groups were still significant ($p = 0.017$) for surgeries performed before and after 1995. The survival between 1984 and 1995 was better than between 1996 and 2006 in both the laparotomy and laparoscopy groups. Further analysis demonstrated that there was a statistically significant lower percentage of Stage IB/IC (60% vs 74.3%, $p = 0.041$) disease in 1984-1995 and a higher percentage of comprehensive staging procedures (60% vs 76.4%, $p = 0.018$) in 1996-2006. A probable explanation is that a comprehensive staging procedure could not reverse the adverse effect of a higher substage on survival.

### Multivariate analysis of prognostic factors

In addition to the statistically significant variables selected from univariate analysis, the cofactors showing strong statistically significant correlations with the above variables by Spearman correlation analysis were also put into the Cox proportional hazards regression model for multivariate analysis. An initial laparoscopy approach had significant adverse impacts on the OS (laparoscopy vs laparotomy, hazard ratio [HR]: 3.52 [95% CI, 1.38-9.02], $p = 0.009$) and the RFS (laparoscopy vs laparotomy, HR: 2.58 [95% CI, 1.13-5.89], $p = 0.024$). However, a higher substage (stage IB-IC vs IA, HR: 8.29 [95% 1.10-62.43], $p = 0.040$) was associated only with a worse OS, and its impact on the RFS was marginal [stage IB-IC vs IA, HR: 2.85 [0.98-7.24], $p = 0.054$) (Table 4).

## DISCUSSION

The prognosis of early-stage ovarian cancer is independently affected by risk factors such as age,

**Table 1.** Characteristics of Patients with Stage I Epithelial Ovarian Cancer (N = 208)

| Characteristic | Laparoscopy | Laparotomy | *p* |
|---|---|---|---|
| | N (%) | N (%) | |
| Age (years) | Mean, 38.9 ± 11.5<br>Median, 35.5 range, 19-58 | Mean, 49.3 ± 13.0<br>Median, 49 range, 19-88 | < 0.001 |
| Stage (Clinical and surgical) | 34 (100) | 174 (100) | 0.410 |
| IA | 7 (20.6) | 55 (31.6) | |
| IB | 1 (2.9) | 8 (4.6) | |
| IC | 26 (76.5) | 111 (63.8) | |
| Histologic type | | | 0.074 |
| Serous papillary | 5 (14.7) | 18 (10.3) | |
| Mucinous | 10 (29.4) | 40 (23.0) | |
| Endometrioid | 4 (11.8) | 56 (32.2) | |
| Clear cell | 14 (41.2) | 53 (30.5) | |
| Undifferentiated | 1 (2.9) | 1 (0.6) | |
| Grade | | | 0.010 |
| 1 | 14 (41.2) | 53 (30.5) | |
| 2 | 0 (0) | 45 (25.9) | |
| 3 | 8 (23.5) | 27 (15.5) | |
| Missing | 12 (35.3) | 49 (28.2) | |
| Frozen section | | | < 0.001 |
| Not done | 16 (47.1) | 30 (17.2) | |
| Performed, benign | 3 (8.8) | 2 (1.1) | |
| Performed, borderline/malignant | 15 (44.1) | 142 (81.6) | |
| Comprehensive surgical staging | | | 0.008 |
| No | 16 (47.1)) | 43 (24.7) | |
| Yes | 18 (52.9) | 131 (75.3) | |
| Immediate | 9 (50) | 124 (94.7) | < 0.001 |
| Delayed | 9 (50) | 7 (5.3) | |
| Treatment after initial diagnosis | | | < 0.001 |
| Observation | 7 (20.6) | 17 (9.8) | |
| Chemotherapy only | 4 (11.8) | 15 (8.6) | |
| Chemotherapy + re-exploration | 5 (14.7) | 11 (6.3) | |
| Immediate staging | 9 (26.5) | 124 (71.3) | |
| Delayed staging | 9 (26.5) | 7 (4.0) | |
| Adjuvant chemotherapy | | | 0.788 |
| No | 9 (26.5) | 35 (20.1) | |
| Yes (PC) | 18 (52.9) | 100 (56.8) | |
| Yes (TP/TC) | 6 (17.6) | 28 (15.9) | |
| Missing | 1 (2.9) | 11 (6.3) | |

**Abbreviations:** PC: cisplatin and cyclophosphamide regimen; TP/TC: paclitaxel and cisplatin or paclitaxel and carboplatin regimen.

**Table 2.** Univariate Analysis of Clinical Pathological Variables in Stage I Epithelial Ovarian Cancer (N = 208)

| Characteristic | N | 5-year OS | *p* | 5-year RFS | *p* |
|---|---|---|---|---|---|
| Age (years), continuous | | | 0.001 | | 0.184 |
| Stage | 208 | | 0.005 | | 0.007 |
| IA | 62 | 98.4% | | 92.8% | |
| IB | 9 | 76.2% | | 77.8% | |
| IC | 137 | 79.5% | | 69.4% | |
| Stage | 208 | | 0.001 | | 0.002 |
| IA | 62 | 98.4% | | 92.8% | |
| IB or IC | 146 | 79.2% | | 70.0% | |
| Histologic type | 208 | | 0.470 | | 0.280 |
| Clear cell/ Undifferentiated | 69 | 79.7% | | 71.8% | |
| Others | 139 | 88.1% | | 79.7% | |
| Grade | 147 | | 0.058 | | 0.036 |
| 1 or 2 | 112 | 88.8% | | 82.8% | |
| 3 | 35 | 73.5% | | 67.8% | |
| Surgical intervention | 208 | | 0.002 | | 0.069 |
| Laparoscopy | 34 | 67.4% | | 69.5% | |
| Laparotomy | 174 | 88.7% | | 78.7% | |
| Frozen section | 208 | | 0.546 | | 0.269 |
| No | 46 | 83.5% | | 76.8% | |
| Yes | 162 | 85.9% | | 77.3% | |
| Comprehensive surgical staging | 208 | | 0.751 | | 0.894 |
| No | 59 | 86.3% | | 78.6% | |
| Yes | 149 | 84.8% | | 76.0% | |
| Treatment after initial diagnosis | 208 | | 0.552 | | 0.229 |
| Observation | 24 | 89.5% | | 82.3% | |
| Chemotherapy | 19 | 88.8% | | 88.8% | |
| Chemotherapy + re-exploration | 16 | 80.8% | | 62.5% | |
| Immediate staging | 133 | 85.4% | | 75.3% | |
| Delayed staging | 16 | 76.9% | | 85.1% | |
| Recurrence | 208 | | < 0.001 | | |
| No | 165 | 99.4% | | | |
| Yes | 43 | 33.8% | | | |
| Recurrence pattern | 208 | | < 0.001 | | |
| None | 165 | 99.4% | | | |
| Local | 32 | 40.6% | | | |
| Distant | 7 | 52.5 mo | | | |
| Both | 3 | 50% | | | |
| Missing | 1 | 35 mo | | | |
| Port-site metastasis | 208 | | < .001 | | |
| No | 204 | 87.7% | | | |
| Yes | 4 | 51 mo | | | |
| Chemotherapy | 208 | | 0.345 | | 0.258 |

**Abbreviations:** OS: overall survival; RFS: recurrence-free survival; PC: cisplatin and cyclophosphamide regimen; TP/TC: paclitaxel and cisplatin or paclitaxel and carboplatin regimen.

stage, grade, extent of lymphadenectomy and rupture before or during surgery.[11,12] Current standard treatment guidelines for patients with early-stage ovarian cancer recommend a laparotomy with a longitudinal median incision to permit thorough surgical staging, and are based on experts' opinions and retrospective studies. The proposed surgical management includes a total hysterectomy, bilateral salpingo-oophorectomy, bilateral pelvic/para-aortic lymphadenectomy, omentectomy and multiple intraabdominal biopsies.[4-6]

The reported incidence of unexpected ovarian malignancy in laparoscopy is 0.4-2.9%.[13] Concerns related to laparoscopy, include inadequate resection, significance of tumor spillage, improper or delay in surgical staging and the possibility of port-site metastasis. It is recommended that laparoscopy be limited to benign ovarian tumors.[10,14] However, reports on advanced laparoscopy techniques in the management of early-stage ovarian cancer have been published with increasing frequency. Some of the reports have addressed the efficacy and safety of laparoscopy procedures without outcome results[8,9] in studies with small sample sizes, limited follow-up, or exclusion of those with tumor spillage during laparoscopy.[15,16]

Lécuru et al. reported on initial staging in 34 patients receiving laparoscopy, 30 with laparoscopy converted to laparotomy and 114 patients undergoing laparotomy for final stage I ovarian cancer, excluding those upstaged at restaging (laparoscopy 39 $\pm$ 35 days, laparotomy 221 $\pm$ 349 days). After a median follow-up of 40 months, the survival rates were not significantly different.[17] Problems of excluding all cases upstaged at restaging underscore the risk of recurrence and death. A Korean retrospective study found no differences in safety and diagnostic efficacy using laparotomy (n = 33) or laparoscopy (n = 19) for primary or delayed staging.[18] In our study, initial laparoscopy had significant adverse influences on the OS and RFS in multivariate analysis. Many of the laparoscopy patients did not have a frozen section (47.1%) without comprehensive staging because of clinically benign features. Most of these cases were designated clinical stage IC after an initial laparoscopy because of intraoperative rupture or failure to use retrieval bags. To be fair, the impact of laparoscopy on long-term survival when all precautions for adnexal masses have been applied is still

**Table 3.** Comparison of 5-year Overall Survival and Recurrence-free Survival Rates between Laparotomy and Laparoscopy Groups

| Years | Surgery | N | Recurrence (N) | Died of disease (N) | 5-year OS | 5-year RFS |
|---|---|---|---|---|---|---|
| 1984-1995 | Laparotomy | 56 | 6 | 2 | 96.3% | 92.7% |
| | Laparoscopy | 4 | 1 | 1 | 75.0% | 75.0% |
| 1996-2006 | Laparotomy | 118 | 27 | 15 | 83.4% | 69.9% |
| | Laparoscopy | 30 | 9 | 8 | 65.2% | 68.0% |
| *p* value* | | | | | 0.017 | 0.216 |

**Abbreviations:** OS: overall survival; RFS: recurrence-free survival. *: Adjusted for the stratification by year (before or after 1995).

**Table 4.** Multivariable Analysis of Overall and Recurrence-free Survival (N = 208)

| | HR* | 95% CI | *p* value |
|---|---|---|---|
| Overall survival* | | | 0.009 |
| Initial surgical intervention | | | |
| Laparotomy | 1 | | |
| Laparoscopy | 3.52 | 1.38-9.02 | |
| Stage | | | 0.040 |
| IA | 1 | | |
| IB-IC | 8.29 | 1.10-62.43 | |
| Recurrence-free survival* | | | |
| Initial surgical intervention | | | 0.024 |
| Laparotomy | 1 | | |
| Laparoscopy | 2.58 | 1.13-5.89 | |
| Stage | | | 0.054 |
| IA | 1 | | |
| IB-IC | 2.85 | 0.98-8.24 | |

**Abbreviations:** HR: hazard ratio; CI: confidence interval.
*: Estimated exposure variables comprise age (continuous), stage (IA versus IB/IC), grade (grade 1/2 versus 3), surgical intervention (laparotomy versus laparoscopy), histological type (clear cell or undifferentiated versus others), staging or not and use of adjuvant chemotherapy (chemotherapy or not). Only significant variables are reported in this table.

unknown. Dembo et al. did not find a significant relationship between intraoperative cystic rupture and prognosis.[19] In contrast, Vergote et al. in a retrospective review of six international databases from Norway, Canada, Sweden, Austria, Denmark, and the United Kingdom, which included 1545 patients with a primary laparotomy for stage I ovarian carcinoma, illustrated that cyst rupture during surgery had an independent unfavorable prognostic effect on the RFS.[11] Moreover, Bakkum-Gamez et al confirmed an adverse impact of capsule rupture on the OS and RFS in stage I ovarian cancer (n = 161).[20] In our series, a higher substage (IB/IC) had significant adverse effects on the outcome. Lehner et al. reported 48 ovarian cancer patients who had a laparotomy after an initial laparoscopy. They found a significant increase in the proportion (58.7%) of advanced-stage ovarian cancers in patients with a laparotomy delayed more than 17 days.[21] Kindermann et al. studied 127 cases of ovarian malignancy managed with laparoscopy, and the upstage rate was 73% (initial laparoscopy followed by laparotomy delayed for more than 8 days).[22] We meticulously excluded those with unsuspected malignancy at initial laparoscopy and upstaging after a short period at our hospital to avoid incorporating higher stage disease in the laparoscopy group. This is probably why patients with delayed staging did not have a worse outcome in our study.

Tumor seeding with port-site metastasis after laparoscopy has been reported in almost all gynecological malignancies. The reported incidence of abdominal wall implantation metastasis is 1% to 20%.[10,14,23,24] Four of 34 laparoscopy patients (11.6%) in our study developed port-site metastases. The pathophysiology of these findings is not clear. Lee et al. demonstrated that palcitaxel can reduce the incidence of tumor implantation and port-site metastasis in animal models.[25] van Dam et al. advocated early administration of chemotherapy to reduce the risk of

port-site implants.[26] Some procedures to minimize the risk of port-site metastasis have been recommended, including (1) using wound protectors; (2) minimizing tumor manipulation; (3) anchoring ports to prevent dislodgment; (4) avoiding carbon dioxide leakage and sudden desufflations; (5) using gasless laparoscopy; (6) irrigating and suctioning the abdomen, instruments and ports before removal; (7) using heparin or 0.25-1% povidone-iodine solution to irrigate wounds and the abdomen; (8) excising trocar sites and deliberate closure of all abdominal layers; (9) postoperative port site radiation; (10) early definitive surgery or chemotherapy; and (11) using 5-fluorouracil, topical taurolidine or intraperitoneal endotoxin. Despite a large number of methods, solid evidence is still lacking on the efficacy of prevention.[27]

In summary, an initial laparoscopy approach and higher substage had significant adverse effects on the OS in stage I epithelial ovarian cancer, while an initial laparoscopy also showed a significant impact on the RFS. The detrimental effects observed in the initial laparoscopy group may be related to a larger number of tumors with higher grades and decreased use of surgical staging compared to the laparotomy group. Retrieval bag protection should be utilized even if the tumor appears benign preoperatively or during laparoscopy inspection, and a frozen section should be done if any suspicious ovarian malignant tissue is found during the operation. Pragmatically, a mass less than 11 cm in diameter can be put in a retrieval bag intact without difficulty or removed through a well-protected colpotomy. For very large ovarian tumors, open laparoscopy or protected colpotomy with controlled drainage of the mass under direct vision could prevent fluid leakage and facilitate subsequent procedures. Puncture or morcellation of an ovarian mass without protection should be avoided. If malignancy is found, comprehensive laparotomy staging is recommended as soon as possible. In addition, excision of the port site should be performed in cases of tumor rupture. Immediate comprehensive laparoscopy staging might also be an option if the necessary precautions have been taken and a competent laparoscopist/oncologist is available. Patients should be informed about the limitations of a frozen section. Early actions (surgical staging with excision of the port site and chemotherapy) should be undertaken if the final pathology shows a malignant tumor.

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# 初始手術方式對第一期卵巢癌的存活影響

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**背 景：** 本研究目的在比較初次手術方式用腹腔鏡及傳統開腹手術對第一期上皮性卵巢癌的存活影響。

**方 法：** 本回溯性研究從西元 1984 年 1 月至 2006 年 12 月，共收集在長庚醫院病理診斷且治療的第一期上皮性卵巢癌的病患，無論是接受初次腹腔鏡或傳統開腹手術都納入研究；並篩選所有接受初次腹腔鏡經病理診斷爲上皮性卵巢癌者，只要最後符合第一期 (臨床或手術分期) 也予納入。統計方法使用獨立樣本 *t* 檢定，卡方檢定及克式比例風險模式。

**結 果：** 共收案 208 位病患，其初始手術包括 34 位使用腹腔鏡手術及 174 位接受傳統開腹手術的患者，存活者的追蹤時間中位數爲 65 個月 (範圍：2-276 個月)，五年總體存活及無復發存活率在腹腔鏡組別爲 67.4% 及 69.5%；在傳統開腹組別爲 88.7% 及 78.7%。復發時間中位數爲 14.5 個月 (範圍：2-67 個月)。在多變數分析統計中，初始手術方式使用腹腔鏡手術 (腹腔鏡比傳統開腹手術，風險比：3.52，$p = 0.009$) 及較高的次分期 (IB-IC 比 IA，風險比：8.29，$p = 0.040$)，對於總體存活有顯著不利的影響。但只有初始手術方式使用腹腔鏡手術對於無復發存活率 (風險比：2.58，$p = 0.024$) 有顯著影響。

**結 論：** 本研究的結果證明在第一期上皮性卵巢癌的病患，初始手術方式使用腹腔鏡手術及較高的次分期，對於總體存活有顯著不利的影響，而只有初始腹腔鏡手術對於無復發存活率有顯著影響。對於子宮附件腫瘤若要使用腹腔鏡手術，建議須注意避免使腫瘤破裂、應使用保護措施，當有腫瘤內固體成份或乳突狀生長，應送冷凍切片。
(長庚醫誌 2010;33:558-67)

**關鍵詞：** 卵巢惡性腫瘤，卵巢癌，腹腔鏡手術，開腹手術，次分期

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