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## Original Research

## **RESULTS OF PELVIC AND PARA-AORTIC LYMPH NODES DISSECTION** SURGERY IN EARLY OVARIAN CANCER

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#### ABSTRACT

Objective: This study aims to explore the characteristics of stage I ovarian cancer, and the surgical outcomes of pelvic and para-aortic lymph nodes (PLN and PALN) dissection.

Methods: A prospective descriptive study was conducted on 34 patients with stage I ovarian cancer from January/ 2018 to March /2021 who underwent PLN and PALN dissection surgery in Danang Oncology Hospital. These patients were followed up for 12 months.

Results: The average age was 48.8 ± 2.3 years old (22 - 75). Symptoms were abdominal pain at 86.8% and urinary disorders at 36.9%. Almost tumors were moved in clinical: 87.1%. Ultrasound found the mixture tumor in 67.7% (MRI: 85.3%), papillae in the tumor was 93.5%, and wall in tumors was 35.5%. The average tumor size was 123.6 ± 16.4 mm (36 - 180). 38.7% of them had increased CA125. The average number of pelvic and para-aortic lymph nodes was 11.5 and 8.1, respectively. There was 1 case with a positive pelvic lymph node and 3 cases with positive para-aortic LN. After surgery, there were 4 cases diagnosed to stage III, accounting for 11.8%. The average surgery time was 188.6 minutes, the average blood loss was 238 ml, and the postoperative in-patient time was 8.9 days. The complications of this operation were found out and well dealt with. There were no recurrent cases at the 6 months postoperation. At 12 months, 1 case had Ca125 > 100 U/ml but no symptom and evidence recurrent on MRI and CT. All patients were alive.

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Conclusion: Pelvic and para-aortic lymph nodes dissection are highly applicable, safe, and acceptable complications, with impressive DFS and OS, and should be performed routinely in oncology centers which appropriate human resources.

Keywords: ovarian cancer surgery, pelvic and para-aortic lymphadenectomy.

## **I. INTRODUCTION**

Globocan 2020 is estimated to have about 6.6 new cases and 4.2 deaths per 100,000 women from ovarian cancer worldwide [1]. With the improvement of screening and examination of gynecological oncology diseases, the percentage of early-stage ovarian cancer patients receiving treatment is increasing.

Treatment of ovarian cancer is increasingly making breakthroughs, in which surgery plays a

very important role, aiming to diagnose, determine the cancer stage and reduce the total mass. Pelvic lymphadenectomy (PLN) and abdominal aortic lymph node dissection (PALN) a major part of the surgical procedure, associated with improved survival, and the major and complex surgery performed in major centers [2].

For early-stage ovarian cancer, studies worldwide have data of 10 to 15% positivity of PLN and PALN lymph nodes [3], which is quite a

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high number to convince the research team to be determined technical implementation.

Positive PLN and PALN pathology results raise the stage of ovarian cancer from stage I to at least stage 3 (depending on lymph node size), so these patients need an appropriate level of postoperative treatment consistent with the diagnosis. On the other hand, negative PLN and PALN in low-risk ovarian cancer can avoid unnecessary chemotherapy [2,3]; hence the importance of pelvic and abdominal dissection is pretty clear. In addition, treatment guidelines from major centers around the world consider PLN and PALN lymphadenectomy routines for early ovarian cancer [4].

This surgery was performed at Da Nang Oncology Hospital, and certain results were obtained. In that context, we conducted this study with two objectives: to evaluate the general characteristics, clinical and subclinical characteristics in patients with stage I ovarian cancer, and to evaluate the results of lymph node dissection surgery pelvic and abdominal aortic nodes at a postoperative time and after 12 months.

# II. MATERIALS AND METHODS 2.1. Subjects

All 34 patients with early-stage ovarian cancer (stage I) were treated surgically, including dissection of the pelvic and abdominal aortic lymph nodes at Da Nang Oncology Hospital from January 2018 to January 2018. March 2021.

Inclusion criteria: (1) Patients with the clinical diagnosis of ovarian cancer, early stage before surgery. (2) On imaging (CT or MRI), there is no pelvic lymph node and the abdominal or pelvic lymph node is smaller than 1.0 cm.

Exclusion criteria: (1) Ovarian cancer stage I, not eligible for major surgery due to: poor physical condition, old age, severe comorbidities. (2) Cases of ovarian cancer stage I, operated on but with incomplete information or lost contact 6 or 12 months after surgery.

#### 2.2. Methods

The study design was based on a descriptive prospective analysis. The sample size was selected by convenience method: 34 cases.

Before surgery: The patient was admitted to the hospital with a preoperative diagnosis by clinical and subclinical means of ovarian cancer. Evaluate Tumor markers to be more certain of the diagnosis.

Using a self-built data collection toolset based on the variables to be taken, closely following the two objectives of the topic (attached in the appendix). CT/MRI scan, to be sure there are no pelvic lymph nodes and ventral or pelvic lymph nodes, abdominal host less than 1.0 cm.

The evaluation was preoperatively suspected of early ovarian cancer, based on the calculation of the RMI risk index.

Carry out surgery: After laparotomy, the upper and lower midline of the umbilicus was explored, the entire peritoneal cavity was explored, to re-evaluate the stage as well as the possibility of radical surgery.

Perform THA-BSO surgery, or conservative

surgery, only remove the ovary containing the tumor, remove the great omentum, and remove the pelvic lymph nodes. Unfold the right colon to the left, exposing the vascular bundle and dissecting the abdominal aortic lymph node to the level of the left renal vein.

When the early clinical stage but laparotomy detects lesions on peritoneum, pelvis, uterus leading to the diagnosis of ovarian cancer later than stage 1, we will not conduct lymph node dissection, and disease type the individual out of the study.

After surgery: Post-operative follow-up, description and handling of possible complications.

Collect results, list, evaluate general, clinical and laboratory characteristics. Evaluate the results of the above parameters at 6 months, 12 months after surgery.

## III. RESULTS

 Table 1: General characteristics, clinical characteristics

General characterist	Ν	%	
Age	Age $\leq 40$		
	40 - 59	14	41,2
	10	29,4	
The element of self	yes	2	6,5
Family factor	yes	1	3,3
Comorbidities	yes	2	6,5
Fat yes		7	22,6

The average age was  $48.8 \pm 12.3$  years old (22 - 75), there were 3 cases with risk factors accounting for 9.7%, 2 cases accounting for 6.5% with comorbidities and the obesity rate was 22.6%. Common symptoms are abdominal pain in 86.8% and urinary disorders in 36.9% of cases. There were

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4 cases of asymptomatic ovarian tumors detected through routine physical examination.

Table 2:	Physical	symptoms
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Physical symptoms		Ν	%
Cervical, uterine abnormalities		0	0,0
ascites		0	0,0
	Easily mobility	27	79,4
Mobility during examination	limited mobility	3	8,7
	No mobility	4	11,8

Most (30 cases) were mobile, accounting for 87.1%. **Table 3:** Subclinical characteristics of ovarian

Gynecologic	Ν	%	
OT	Unilateral	27	79,4
Ovarian Tumor	bilateral	7	20,6
т ·	< 50 mm	10	29,4
Tumor size	50-99  mm	11	32,8
100 – 180 mm		13	36,9
	Solid form	5	14,7
Nature tumor	Capsule form	6	17,6
	Mixed form	23	67,7
Tumor	Buds, papillae	30	93,5
characteristics	wallification	13	35,5

Ultrasonography of tumors is mainly mixed form 67.7%, with buds, papillary accounting for 93.5%, rate with walls at 35.5%. The average tumor size was  $123.6 \pm 16.4 \text{ mm} (36 - 180 \text{ mm})$ .

Table 4: Pelvic MRI				
Pelvio	e MRI	Ν	%	
о · т	Unilateral	27	79,4	
Ovarian Tumor	bilateral	7	20,6	
	< 50	8	23,5	
Tumor size	50 - 99	13	36,9	
	100 - 179	11	32,8	
	≥180	2	5,9	
Notes and the second	Solid form	5	14,7	
Inature tumor	Capsule form	29	85,3	
Tumor	Mixed form	27	87,1	
characteristics Buds, papillae		7	12.9	

Tumor size on MRI seems to be larger: there are 2 cases > 180 mm, and mixed form is more than 85.3% when using only ultrasound.

Tumor marker: Ca 125 increased in 13 cases, accounting for 38.7% and AFP increased in 3 cases, accounting for 8.8%. There were no cases of increased Beta HCG.

Pathology	N	Positive pelvic, Para-aortic lymph nodes
Serous carcinoma G2, G3	11	2 (18,5%)
Mucinous Carcinoma	7	0 (0%)
Endometrial Carcinoma	3	0 (0%)
Clear cell Carcinoma	4	2 (50%)
Another	9	0 (0%)
total	34	4 (11,8%)

The most common histopathology with lymph node metastasis is grade 2 and 3 serous carcinoma and clear cell carcinoma.

Surgical characteristics	Result
Average time of surgery (minutes)	188,6 ± 58,7 minutes
The average amount of blood loss (ml)	$238 \pm 99,6 \text{ ml}$
Postoperative time (days)	8,9 days
Using anticoagulants	2 cases
Intraoperative blood transfusion	2 cases

Table 6: Evaluation of surgical results

The majority of surgery time was from 180 - 239 minutes 51.6%. Most blood loss was less than 200 ml 66.7%. The mean postoperative time was 8.9 days. The earliest case was discharged after 5 days and 2 cases were discharged after 20 days.

The number of pelvic lymph nodes and positive nodes: The number of pelvic lymph nodes removed from 1 patient is mainly from 5 to 10, with 17 patients accounting for 50%. The average number of pelvic lymph nodes removed was 11.5. There was 1 case of 2 positive iliac lymph nodes / 8 lymph nodes, accounting for 3.0 % of patients.

The number of abdominal aortic nodes removed and positive nodes: The number of most removed abdominal aortic nodes from 5 to 10 lymph nodes: 19 patients accounted for 55.9%. The average number of abdominal aortic nodes removed was 8.1. There were 3 positive abdominal aortic node cases: 2 cases with 1 metastatic lymph node and 1 with 2 metastatic nodes.

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Complications	N (%)
Bleeding due to damage to a large vessel	1 (3,0%)
Ureteral injury	1 (3,0%)
Injury to the small intestine	4 (12,8%)
Bladder damage	1 (3,0%)
Intraoperative blood transfusion	2 (5,9%)
Uncomplicated	27 (79,5%)
Lymphatic cyst after surgery	1(3,0%)
Anemia after surgery	1 (3,0%)
Bowel obstruction requires sur- gery again	1 (3,0%)

Table 7: Complications

There were no cases of venous thrombosis, postoperative ureteral fistula, wound infection

Re-examination at 6 months after surgery: We conduct a clinical and subclinical evaluation with Ca125, X-ray ultrasound, or CT. The results did not find any patients with evidence of recurrence.

Evaluation results at 12 months after surgery: All patients are alive. 33/34 patients had no change in Tumor marker index and clinical and imaging studies. There was 1 case of biochemical recurrence with Ca125 > 100 U/ml, but the lesion location was not found on CT and MRI. We are continuing to evaluate PET/CT.

## **IV. DISCUSSION**

#### 4.1. General and clinical features, subclinical

Age: The average age in the study group is 48.8  $\pm$  2.3 years old (22 – 75); compared to other studies, the age in our patient group is somewhat younger. This may be because our study focused on very early stage I.

Symptoms: Ovarian cancer often has few symptoms in its early stages. Common symptoms of ovarian cancer are pain in the lower abdomen,

symptoms of urinary tract disorders (frequent urination, urinary frequency), or menstrual disorders.

Physical symptoms: Ascites: In the study, no cases were recorded, which is understandable when the symptoms of ascites are usually advanced patients. The degree of tumor mobility on clinical examination is an important factor in examining

ovarian tumors [5]. A mobile tumor on clinical examination is likely to be at an early stage when the tumor has not invaded the surrounding area, and is favorable for surgery. In the study, the vast majority of tumors were mobile on examination.

Subclinical: Gynecological ultrasound can detect ovarian tumors and evaluate the characteristics, nature, and status of the septum or papillae in the tumor. Most ovarian tumors are mixed forms, accounting for 67.7%, a typical image for ovarian carcinoma. Pelvic MRI is the most valuable test in evaluating pelvic abnormalities, including ovarian tumors. Compared with CT and ultrasound, pelvic MRI is more objective and software evaluation. Regarding tumor size: compared with ultrasound, the tumor size is usually larger in diameter. This is because MRI can evaluate the invasive lesions around the tumor. CA125 increased only in 38.7% of cases. This can be explained: our study was only performed in phase I; there were 4 cases of borderline malignant tumors and 2 cases of ovarian stromal origin. In our study, carcinoma derived from the epithelium accounted for only 77.4% of cases, up to 9% of which were mucinous.

#### **4.2.** Evaluation of surgical results

 Table 8: Characteristics of ovarian cancer lymph

 node dissection in studies

Study	Operation time	Post operation time	Blood loss
Chu Văn Chiến	Not examined	11,9 days	Not examined
Bogani et al	178 minutes	9,7 days	257ml
Harter (LION)	340 minutes	Not examined	650ml
Yeong et al	221 minutes	8,9 days	240ml
Our	188 minutes	8,9 days	238,6ml

Just as the surgical time often prolongs the initial period of the study, blood loss is usually high in the early stages, with less blood loss later in life. Looking at the reports, our operative time was quite impressive [6]. Another domestic study on ovarian cancer surgery by Chu Van Chien gave a rather long postoperative time of 11.9 days. Our study had complicated abdominal dissection but a quick recovery time 8,9 days [7].

Complications of PLN, PALN lymph node dissection surgery in surgery: Our results are quite similar to the authors Jeong - Yeol Park, the authors Chu Van Chien, Le Thi Hang have relatively low

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complication rates from 0 to 0. up to 2%, except for intestinal injury, 7.4% of Chu Van Chien [5,7,8]. In fact, these complications are mild, are detected in surgery and can be handled without too much difficulty.

Complications of postoperative PLN and PALN lymph node dissection: 1 case had to be re-operated to resolve complications of intestinal obstruction on the 5th day after surgery. There were no cases of lymphedema and death after 30 days. This is quite consistent with domestic and foreign studies [1,2,5,9]. One problem with long surgeries like ovarian cancer surgery was wound infection, but our results were pretty good as no cases were reported. Thanks to the very strict adherence to infection control procedures of the surgeon, equipment and operating room.

nodes in studies				
Study	Pelvic Lymth's number	Para-aotic Lymth's number		
Antonio Ditto	23	20		
Guldeniz	25	10		
Harter (LION)	35	22		
our	11,5	8,1		

**Table 9:** Number of pelvic and abdominal aortic

Our number of pelvic and abdominal lymph nodes is less than that of foreign studies, partly because this is a relatively new surgery, difficult for domestic gynecological surgeons, and the LION trial is a study on a population of patients with advanced stage disease IIB to stage IV [10], while our study was an early-stage patient.

Author	Patient's number	Metastasis PLN	Metastasis PALN	Metastasis PLN and metastasis	Systemic lymph node
Petru et al	40	7 (17,5%)	1 (2,5%)	1(2,5%)	9 (22,5%)
Sakai et al	63	2 (3,2%)	2 (3,2%)	0	4 (6,4%)
Harter et al	70	0	4 (5,7%)	4(5,7%)	8 (11,4%)
Benedetti	37	3 (8,1%)	2 (5,4%)	0	5 (13,5%)
Our study	34	1 (3.0%)	3 (8.8%)	0	4 (11.8%)
Total	241	13 (5,4%)	11 (4,6%)	5 (2,1%)	29 (12,0%)

Table 10: PLN and PALN lymph node metastasis rates in studies.

Studies worldwide on systemic lymphadenectomy in early ovarian cancer Benedetti-Panici have a metastasis rate of 13.5% [11], quite similar to ours. In comparison, the Japanese author- Sakai et al studied 63 early-stage patients for our lower result of 6.4% [12]. In general, the results after systemic lymphadenectomy to raise the stage of ovarian cancer to stage III is 12%, and our study is 11.8%.

This study has 2 cases of positive lymph nodes on clear cell ovarian cancer (6.4%) and 2 cases of high-grade serous carcinoma (6.4%). This is consistent with previous studies such as Suzuki and Guldeniz [3,13]. Our combination of studies and studies shows that systemic lymphadenectomy is important in high-risk diseases such as clear cell and high-grade.

#### 4.3. Evaluation of results at 6, 12 months

Six months is a very important time because the prognosis will be worse if the patient relapses and is considered Platinum resistant. However, no recurrence has been observed, consistent with domestic and international studies, probably due to the early stage of cancer.

At 12 months after surgery, only 1 case (2.9%) had a biochemical recurrence, and no physical damage was detected. Ca 125 increasing around 100 U/ml may be due to pelvic inflammatory disease or early recurrence, so it is impossible to accurately confirm whether it is a true recurrence. Compared with the study of Michelle L et al., at 12 months, 6 out of 124 (4.8%) patients with relapse seems to be higher than our study [14]. This is explained by the different

sample sizes and Michelle's failure to undergo systemic lymphadenectomy in the stage I patient [14].

To see improvements in DFS and OS compared to previous studies, longer-term studies and larger sample sizes are needed in this group of patients or not. Therefore, we also still conduct follow-up visits every 3 months and summarize the data at 24 and 36 months for further research.

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#### **V.CONCLUSION**

PLN and PALN lymph node dissection surgery has high applicability, safety, and acceptable complications. Therefore, this technique should be used routinely in well-trained and resourced oncology centers.

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