Prognostic Factors and Survival of Borderline Ovarian Tumors in Rajavithi Hospital between 1979-2006 A.D.

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Objective: *Evaluate 5-year progression-free survival, 5-year disease-specific survival, and prognostic factors for recurrence and survival in patients with borderline ovarian tumors in Rajavithi Hospital.*
Material and Method: *A retrospective study of the patients with borderline ovarian tumors who were treated at Rajavithi Hospital before 2006 was performed. Patients' clinical characteristics, detail of treatment and all variables that seemed to influence survival or recurrence of disease and patients' life status were obtained from gynecologic oncologic files, medical record documents, and National Population Statistic Office Database*
Results: *Two hundred ten patients were enrolled in the present study. Nearly 90% (187 patients, 89%) had stage I disease. Another seven (3.3%) were in stage II, 15 (7.2%) in stage III, and one (0.5%) in stage IV. The most common histology was mucinous (157 patients, 74.8%), followed by serous (49 patients, 23.3%) and mixed serous and mucinous (4 patients, 1.9%). The mean age of the patients was 41 years (range, 14 to 82 years). The mean size of tumor was 17 cm (range, 5 to 40 cm). The majority of primary treatment was by surgery only at approximately 87.6% (184 patients) and the remaining 12.4% (26 patients) was surgery plus adjuvant chemotherapy. Bilateral ovarian involvement was found in 13 patients (6.2%). Twenty-three percent of patients with peritoneal implants had bilateral ovarian involvement whereas the rate in the group without peritoneal implants was 5.7%. The 5-year progression-free survival (PFS) and 5-year disease-specific interval (DSS) were 92.32% and 95.72% respectively. Nine patients (4.3%) had recurrence of disease and 11(5.2%) died of disease. Salvage therapy mainly was surgery and three patients (33%) were cured without evidence of disease. Univariate analysis showed two significant prognostic factors for PFS. Those were stage of disease and optimal debulking. The four significant prognostic factors for DSS were stage of disease, optimal debulking, rupture of tumor, and presence of ascites. Conservative surgery, incomplete staging, lymphadenectomy, periovarian adhesion, or positive peritoneal cytology did not seem to influence PFS and DSS. Independent prognostic factor for PFS and DSS could not be conclusively drawn by multivariate analysis because of far too few death and recurrence events in the present study.*
Conclusion: *The borderline ovarian tumors had an excellent prognosis. Conservative surgery should be carried out in women at reproductive age with early stage of disease who have fertility desire.*

Keywords: *Borderline ovarian tumors; Prognostic factors; Recurrence; Survival*

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Borderline epithelial ovarian tumors (BOTs) were accepted in a separate entity by Federation International of Gynecology and Obstetrics (FIGO) in 1971 as they differed from epithelial ovarian cancer in pathological criteria and nature of disease. They had an excellent prognosis with overall survival of 92%, and total recurrence rate of 7.3%[1]. They accounted for approximately 10 to 15% of all ovarian tumors. The majority of about 50 to 85% were in stage I disease at the time of the diagnosis[2] and frequently affected in reproductive aged women who wanted to preserve their fertility function. With current knowledge of natural history regarding tumors inevitably changed the management from radical surgery to a more conservative surgery. Surgical staging or radical surgery, is it mandatory? Many studies that showed the safety of conservative surgery with unilateral salpingo-oophorectomy or cystectomy for patients with stage I borderline ovarian tumors that still needed fertility[3-5]. The conservative surgery has been undergone even in women with advanced stage of disease. Although recurrence was more often seen

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after conservative surgery, all cases of recurrent disease could be detected and treated with good follow-up. Furthermore, some studies suggested that lymphadenectomy had no benefit for recurrence and survival and could be omitted even for advanced stages of disease[2,6,7]. For these reasons, the authors wanted to evaluate type of surgery either radical or conservative surgery or other prognostic factors such as lymphadenectomy done/not done, or incomplete staging/complete staging to see if they influenced survival or recurrence of disease in the presented patients. The other aim of the present study was to evaluate 5-year disease-specific survival (5-year DSS) and 5-year progression-free interval (5-year PFS) of these tumors.

Material and Method

Two hundred ten patients with histological confirmed borderline ovarian tumors that had been treated in Rajavithi Hospital between 1978 and 2006 were reviewed for this retrospective study, approved by Rajavithi Hospital Ethics Committee.

Most of them were referred from provincial hospitals. All variables were retrieved from medical records. They included age, stage of disease, conservative or radical surgery (conservative surgery defined as a surgical procedure with conservation of the uterus and at least one ovary), special emphases were placed on records dealt with following parameters or not dealt with, such as complete staging, restaging, optimal debulking, lymphadenectomy, rupture, adhesion, peritoneal implants, presence of ascites, positive cytology, positive lymph nodes, recurrence, and date of last follow-up.

Patients' mortality and causes of death would be obtained from the National Population Statistic Office Database.

With regarding to refer cases that underwent surgery from other hospitals, pathological studies were reviewed by the present gynecologic pathologists.

Patients' follow-up records would include a clinical examination, CA125 every three months during the first year following the procedure, then every six months for two years and then yearly thereafter.

Progression-free survival (PFS) was defined as the time of complete treatment to the time of recurrence or last follow-up. Disease-specific survival (DSS) was defined as the time of diagnosis to the time of death of disease or last follow-up. Kaplan-Meier method was used to measure rate of survival and being tested using the log-rank test. Univariate and multivariate analysis with p-value were generated applying the Cox regression analysis with hazards ratios of 95% confidence interval. Statistical significance was set at $p < 0.05$.

Results

Two hundred ten patients with borderline ovarian tumors (BOTs) were enrolled in this retrospective study. The patients' characteristics were presented in Table 1. Nearly 90% of them had stage I

Table 1. Patients' characteristics

Total number of patients	n = 210
Mean age (range)	41 (14-82)
Median follow-up time (months)	21.9 (0.33-293)
Median time to recurrence (months)	32 (3-65)
Mean tumor size (cm, range)	17 (5-40)
Histology	
Serous	49 (23.3%)
Mucinous	157 (74.8%)
Mixed serous and mucinous	4 (1.9%)
Stage	
I	187 (89.0%)
II	7 (3.3%)
III	15 (7.2%)
IV	1 (0.5%)
Type of primary treatment	
Surgery only	184 (87.6%)
Surgery and adjuvant chemotherapy	26 (12.4%)
Laterality	
Unilateral	197 (93.8%)
Bilateral	13 (6.2%)
Rupture	45 (21.4%)
Peritoneal implant	17 (8.2%)
Torsion	8 (3.8%)
Tumor excrescence	6 (2.9%)
Periovarian adhesion	27 (13.0%)
Ascites	46 (21.9%)
Positive cytology	43 (21.0%)
Positive lymph nodes (66 lymphadenectomies)	0 (0%)
Positive appendix in case of mucinous BOT (61 appendectomies)	1 (1.6%)
Recurrence rate	9 (4.3%)
Death of disease rate	11 (5.2%)

disease (187 patients, 89%). Only 10% of patients had the other stages with seven patients (3.3%) in stage II, 15 (7.2%) in stage III, and one (0.5%) stage IV. Most common histology was mucinous (157 patients, 74.8%), followed by serous (49, 23.3%), and mixed serous and mucinous (4, 1.9%). The mean age of the patients was 41 years (range, 14 to 82 years. The mean size of tumor was 17 cm (range, 5 to 40 cm). Thirteen patients (6.2%) had bilateral ovarian involvement and included ten serous BOTs (77%) and three mucinous BOTs (23%) respectively. Twenty-three percent of patient with peritoneal implants had bilateral ovarian involvement as compared to 5.7% in those without peritoneal implants. The details of operation in the patients are shown in Table 2. Conservative surgery was undergone in 84 patients (40%) and 126 patients (60%) received radical surgery. Ninety-eight percent of the operation for conservative surgery was salpingo-oophorectomy and only 2% (2 patients) was ovarian cystectomy. Lymphadenectomy was performed on 66 patients (31.4%) whereas 144 patients (68.6%) did not undergone lymphadenectomy. No patient showed positive lymph nodes in all lymphadenectomies. The number of the patients who underwent incomplete staging was 2.44 times (71% to 29%) higher than those who underwent complete staging. Only 1.34% (2 out of 149 patients) of incomplete staged patients underwent restaging. Of 68 Appendectomies, 61 were performed in mucinous BOTs and only one case was found to be positive mucinous borderline tumor of appendix. Majority of primary treatments was surgery only (184 patients, 87.6%) and the remaining 12.4% (26 patients) was surgery plus adjuvant chemotherapy. The regimens of chemotherapy were single cisplatin/carboplatin, carboplatin and cyclophosphamide, melphalan, and oral endoxan. Nearly 70% of patients who received chemotherapy had stage I disease. The reason for these unusual events may result from lack of knowledge about the nature of the BOTs in the past.

Only nine (4.3%) patients developed recurrent disease. Patients with early stage of disease had lower risk of recurrent rate at 3.6% (7 patients' in194). On the contrary, patients with advanced stage of disease had a higher risk of recurrent rate at 12.5% (2 patients in 16). The median of time to recurrence was 32 months. Although six out of these patients died of disease, the median time of DSS of the patients with recurrence was still high at about 70 months. The 5-year progression free survival (5-year PFS) was also high as 92.32%. According to univariate analysis (Table 3), two significant prognostic factors for progression-free survival were identified; those were stage of disease and optimal debulking. Conservative surgery, incomplete staging, rupture of tumor, lymphadenectomy, periovarian adhesion, presence of ascites, positive peritoneal cytology did not influence 5-year PFS.

Table 2. Details of operation

Type of surgery	
Conservative	84 (40.0%)
Radical	126 (60.0%)
Complete staging	
Incomplete	149 (71.0%)
Complete	61 (29.0%)
Restaging in case of incomplete staging	
Not done	147 (98.6%)
Done	2 (1.34%)
Lymphadenectomy	
Not done	144 (68.6%)
Done	66 (31.4%)
Optimal debulking	196 (93.0%)
Laparotomy	210 (100%)
Ovarian cystectomy	2 (1.0%)
Appendectomy	68 (33.3%)

The salvage therapy for BOTs with recurrence was surgery alone in most cases and a few cases had been treated with surgery plus chemotherapy or chemotherapy alone. Three patients (33%) showed no evidence of disease after treatment. Despite the remaining six patients who did not have complete response or lived with disease, the time to death was quite long (mean 51.8 months, ranging from 8.4 to 80.3 months).

Only 11 deaths from disease (5.2%) were identified in the present study. Four of them died with unknown status of recurrence, due to short of follow-up time or loss follow-up. The 5-year survival (5-year DSS) was also high at 95.72%. The median survival could not be established due to lower number of death in patients. Univariate analysis (Table 3) disclosed 4 significant prognostic factors for 5-year DSS, these were stage of disease, optimal debulking, rupture of tumor and presence of ascites. Conservative surgery, incomplete staging, lymphadenectomy, periovarian adhesion, positive peritoneal cytology did not have influence on 5-year DSS. The clinical characteristics of the

Table 3. Univariate analyses for DSS and PFS in borderline ovarian tumors

Factors	5-yr DSS	p-value	HR (95% CI)	5-yr PFS	p-value	HR (95% CI)
Stage						
I + II	97.68	<0.001*	13.88 (4.21-5.78)	94.70	0.0276*	4.98 (1.02-24.36)
III + IV	71.08			40.00		
Histology						
Serous	97.73	0.864	1.23 (0.328-0.664)	88.61	0.6390	1.83 (0.46-7.31)
Mucinous	94.99			93.04		
Complete staging						
No	97.61	0.109	0.30 (0.09-1.02)	91.74	0.6885	1.33 (0.33-5.34)
Yes	91.47			93.96		
Conservative surgery						
No	94.74	0.2701	0.37 (0.08-1.74)	90.70	0.3501	0.48 (0.1-2.32)
Yes	98.57			95.31		
Lymphadenectomy						
Not done	97.57	0.1383	2.50 (0.71-8.78)	91.51	0.8000	1.19 (0.29-4.81)
Done	91.85			94.37		
Optimal debulking						
No	0	<0.001*	52.85 (10.37-209.62)	0	<0.001*	19.69 (2.31-167.49)
Yes	96.55			94.64		
Rupture						
No	98.25	0.003*	9.61 (1.94-47.70)	95.88	0.1486	4.04 (0.90-18.06)
Yes	85.00			85.97		
Tumor exescence						
No	95.28	0.8661	17.04 (3.8-76.33)	95.45	0.0903	-
Yes	100.00			71.11		
Adhesion						
No	95.98	0.512	2.11 (0.41-10.89)	94.50	0.2429	1.26 (0.14-11.26)
Yes	92.31			100.00		
Ascites						
No	98.41	0.0161*	4.47 (1.35-14.8)	92.46	0.6769	1.40 (0.29-6.79)
Yes	86.30			88.76		
Cytology-positive						
No	96.04	0.7870	1.414 (0.17-1.76)	95.13	0.6875	-
Yes	92.31			100.00		

HR= hazard ratio

13 patients with recurrence or death are shown in Table 4.

Independent prognostic factor for 5-year DSS could not be drawn by multivariate analysis, because of few deaths and recurrence events in the present study.

The accuracy of frozen section examination in the present study was about 62%. Inaccurate results were over-diagnosed a BOT as a malignant tumor and under-diagnosed a BOT as a benign tumor. The majority (22/26, 84%) was under-diagnosed a BOT as a benign tumor especially in patients with mucinous BOTs (Table 5).

Discussion

Of the 210 patients with BOTs, there were low incidence of recurrences and deaths, which were 4.3 and 5.2% respectively. Five-year PFS and 5-year DSS were 92.32% and 95.72%, which were similar to the previous literatures[2,8-10]. Ninety-five patients (45%)

Table 4. The clinical characteristics of the patients with recurrence or death

Case	Age	Histology	Stage	Operation	CMT	PFS	Recurrence site	Salvage treatment	DSS	Status
1	59	Mucinous	Ia	TAH+BSO	No	3.0 m	Abdomen	Large bowel resection with colostomy with appendectomy	183.0 m	NED
2	32	Mucinous	II	TAH+BSO+BPND +PANS+OMT	No	6.5 m	Rectum	NA	8.4 m	DOD
3	20	Serous	I	Lt. SO	No	16.0 m	Rt.ovary	Rt.cystectomy and 5 months later TAH with Rt.SO was performed because of 2nd recurrence	236.0 m	NED
4	45	Mucinous	Ic	TAH+BSO	No	17.0 m	Seedings all peritoneum and Rt.pelvic mass with mucin ascites 2,000 cc	Inoperable and omental biopsy only Patho.result: inflammation PC*1 then loss follow-up	256.0 m	NED
5	72	Mucinous	Ia	TAH+BSO +Rt.PNS	No	32.0 m	Surgical wound scar 2nd recurrence-spleen	Mass excision and 4 m later splenic mass found then splenectomy done and P*8	51.0 m	DOD
6	19	Mucinous	Ia	Rt.SO	No	34.0 m	Ascites with positive cytology (adeno CA) Neg CT whole abdomen	TAH+Lt.SO+OMT+appendectomy (all tissues-normal) And PC*2 then discontinued because of progression on chemotherapy	44.2 m	DOD
7	63	Mucinous	III	TAH+BSO+OMT	No	41.0 m	Mass at liver, diaphragm and omental cake with ascites 2,000 cc	Omental biopsy (inoperable) The section was pseudomyxoma peritonei	56.8 m	DOD
8	29	Serous	III	TAH+BSO+OMT	No	58.7 m	Mass behind stomach and middle lobe of Rt.lung	PC*2 Response-unknown	80.3 m	DOD
9	66	Serous	Ic	TAH+BSO+BPND +PANS+OMT	P*6; CR	64.8 m	Mass 8 cm: vaginal stump	PEB*1 then loss follow-up	70.3 m	DOD
10	62	Mucinous	IV	TAH+BSO+BPND +PANS+OMT	PC*8; PR	9.5 m	NA	No	21.0 m	DOD
11	44	Mucinous	Ic	TAH+BSO+BPND +PANS+OMT	No	6.4 m	NA	No	8.5 m	DOD
12	49	Serous	III	USO+OMT	PC*4; SD	1.5 m	NA	No	6.8 m	DOD
13	60	Mucinous	III	TAH+BSO+BPND +PANS+OMT	PC*1; NA LFU	0.3 m	NA	No	2.4 m	DOD

PFS = progression-free survival; DSS = disease specific survival; m = months; DOD = died of disease; NED = no evidence of disease; Rt. = right; Lt. = left; TAH = total abdominal hysterectomy; BSO = bilateral salpingo-oophorectomy; BPND = bilateral pelvic node dissection; PNS = pelvic node sampling; PANS = paraaortic node sampling; OMT = omentectomy; CMT = chemotherapy; CR = complete response; PR = partial response; LFU = loss follow-up; NA = not accessible; PC = cisplatin/carboplatin and cyclophosphamide; P = cisplatin/carboplatin; PEB = cisplatin, etoposide and bleomycin

Table 5. Frozen sections in borderline ovarian tumors

Histology	Result of frozen section (63 patients)		
	Benign	Borderline	Malignancy
Mucinous	21	33	2
Serous	1	4	2
Mixed	0	2	0

were in the age range of 35 years or less and the majority of them were in stage I disease (89%). The fertility issue was important for these patients, therefore conservative surgery was adapted in order to keep their fertility function.

Conservative surgery was followed in the present study, 99% was unilateral salpingo-oophorectomy and 1% (2 patients) was unilateral cystectomy. All of the patients underwent laparotomic surgery. The huge mass, suspicious of ovarian malignancy before operation, and lack of laparoscopic expertise in complicated cases might cause no laparoscopic surgery for these patients. A higher rate of recurrence after cystectomy when compared to salpingo-oophorectomy varied from 15 to 36.3%[3,11]. De Iaco et al[4] reported the rate of recurrence was 34% in the cystectomy group, 20% in the unilateral salpingo-oophorectomy group, and 6% in the radical group. These patients with recurrences had an excellent long-term survival and none of them died of disease. For this reason, the recommendation for conservative treatment was unilateral oophorectomy via either laparotomy or laparoscopy[11,12]. Cystectomy should be reserved for patients with previous unilateral salpingo-oophorectomy or presenting bilateral lesions[4,6]. Nevertheless, there was no recurrence in the presented two patients with cystectomy and they are still alive without disease at present.

Many studies have reported the safety of conservative surgery with unilateral salpingo-oophorectomy for patients with stage I borderline ovarian tumors or even in patients with advanced-stage disease. This confirmed the authors'observation that there was no difference in both 5-year PFS and 5-year DSS (95.31/90.7%; 98.57/94.74%, p = NS) between those who underwent conservative surgery and radical surgery.

Among 63 frozen sections of the present study, 21 out of 56 patients (37.5%) with mucinous BOTs had the frozen section examination under-diagnosed a BOT as a benign tumor that lead to undergo more conservative surgery in these patients. However, the high percentage of the under-diagnosed a BOT as a benign tumor in the present study had no effect in both survivals. Kim et al[13] reported similar results and concluded that the under-diagnosis by frozen section examination did not compromise the outcome in patients with BOTs, although under-diagnosis was associated with more conservative surgery.

Only 1.34% (2 out of 149 patients) of incomplete staged patients underwent restaging in the present study. No significant difference of 5-year PFS and 5-year DSS (93.96/91.74%; 91.47/97.61%, p = NS) were observed between patients who underwent complete staging and those who did not. This result seemed to suggest that complete staging was not mandatory for BOTs. This observation was confirmed by Zapardiel et al[14] and Camatte et al[15]. The former investigator reported that there was no difference of overall survival between upstaged and non-upstaged patients and between those who underwent conservative versus complete staging. The later investigator suggested that in case of incomplete initial surgery in patients with apparent stage I disease, restaging did not modify the survival of patients and recommended omitting restaging if the normal-looking peritoneum was presented at the first time of surgery, in the absence of a micropapillary pattern, and if the patient agreed to be carefully followed-up. Nevertheless, complete surgical staging was still recommended in the case of the frozen-section examination indicated a borderline or invasive malignancy, although there was no difference in survival and recurrence rates between staged or unstaged patients as discussed earlier[2,16].

According to lymphadenectomy aspects, there were 66 patients (31.4%) who underwent lymphadenectomy, whereas 144 patients did not. Not surprisingly, all lymph nodes were negative for malignancy or borderline tumors. Camatte et al[17] reported only three series that reported on more than five patients with nodal involvement and their study was the second largest series. They observed eight patients with nodal involvement related to BOT among a series of 42 lymphadenectomies performed in patients treated for BOTs. All patients with nodal involvement had serous BOT with peritoneal implants so they suggested routine lymphadenectomy should not be performed in patients with early-stage disease and should be carried out in patients with serous tumor and enlarged lymph nodes. Finally, the present study showed no significant difference in 5-year PFS and 5-year DSS (94.37/91.51; 91.85/97.57%, p = NS) between patients who underwent lymphadenectomy

and those who did not.. This finding was similar to many reports that routine lymphadenectomy might not be necessary with BOTs[2,15,17,18].

Many authors have recommended appendectomy for mucinous tumors[15,19]. In this study, 61 out of 68 appendectomies were performed in mucinous BOTs. All of them were negative for malignancy or borderline tumor except only one case (1/61, 1.6%) was positive for mucinous borderline lesion. Nevertheless, this case had stage IIIB with pseudomyxoma peritonei. Multiple seeding at omentum, liver surface, and diaphragm were noted.

The present study was limited by weaknesses of data from retrospective design and non-homogenous pattern of the treatment because of the long period of time (28 years) for recruitment of the patients. Some physicians gave unnecessary chemotherapy to the patients with stage 1 of disease in the past because they did not know well about the nature of BOTs. Another weakness was referral cases that underwent surgery from a referred hospital that resulted in poor accuracy of patients' operative findings and clinical characteristics. Furthermore, a relatively short median follow-up time of only 21.9 months due to a favorable prognosis of the disease was another weakness. Longer follow-up time would promote good assessment for recurrence and survival. Four out of 11 deaths that died of disease with unknown status of recurrence might have resulted from a short follow-up time in which most patients likely developed recurrence or death from disease after date of last follow-up.

Potential conflicts of interest

None.

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ปัจจัยพยากรณ์โรคและการรอดชีพของมะเร็งรังไข่ชนิด borderline ในโรงพยาบาลราชวิถี ปี พ.ศ. 2512-2549

สมบูรณ์ ศรศุกลรัตน์, สุเพ็ชร ทุ้ยแป

วัตถุประสงค์: *เพื่อต้องการทราบอัตราการรอดชีพและอัตราการปลอดจากกลับเป็นซ้ำที่ 5 ปี รวมทั้งปัจจัยพยากรณ์โรคที่มีผลต่อการกลับเป็นซ้ำและการรอดชีพ ในผู้ป่วยมะเร็งรังไข่ชนิด borderline ที่รักษาในโรงพยาบาลราชวิถี*

วัสดุและวิธีการ: *เป็นการศึกษาย้อนหลังผู้ป่วยมะเร็งรังไข่ชนิด borderline ที่ได้รับการรักษาในโรงพยาบาลราชวิถี ก่อนปี พ.ศ. 2549 โดยรวบรวมลักษณะทางคลินิกของผู้ป่วย ปัจจัยที่น่าจะมีผลต่อการเป็นซ้ำและการรอดชีพจากแฟ้มมะเร็งนรีเวชและเอกสารทางการแพทย์ และรายละเอียดการตายจากการค้นฐานข้อมูลทะเบียนราษฎร์ของกระทรวงมหาดไทย*

ผลการศึกษา: *ผู้ป่วยจำนวน 210 คน ได้รับการคัดเลือกเข้าการศึกษานี้ ผู้ป่วยส่วนใหญ่เกือบ 90% เป็นระยะที่ 1 (187 คน, 89%) ที่เหลือเป็นระยะต่าง ๆ ได้แก่ ระยะที่ 2 มี 7 คน (3.3%), ระยะที่ 3 มี 15 คน (7.2%) และระยะที่ 4 มี 1 คน (0.5%) ตามลำดับ ผลพยาธิวิทยาที่พบบ่อยที่สุดเรียงตามลำดับดังนี้ ชนิด mucinous (157 คน, 74.8%), ชนิด serous (49 คน, 23.3%) และชนิดผสม serous and mucinous (4 คน, 1.9%) อายุเฉลี่ย 41 ปี (14-82 ปี) ขนาดของก้อนเฉลี่ย 17 เซนติเมตร (5-40 เซนติเมตร) สำหรับผู้ป่วยที่มี bilateral ovarian involvement มีจำนวน 13 คน (6.2%) และพบ bilateral involvement ถึง 23% ในกลุ่มที่มี peritoneal implants ในขณะที่พบเพียง 5.7% ในกลุ่มที่ไม่มี peritoneal implants อัตราการปลอดจากการกลับเป็นซ้ำของโรค และอัตราการรอดชีพที่ 5 ปี เท่ากับ 92.32 และ 95.72% ตามลำดับ การกลับเป็นซ้ำพบเพียง 9 คน (4.3%) และตายจากโรคจำนวน 11 คน (5.2%) การรักษาสำหรับผู้ป่วยที่มีการกลับเป็นซ้ำ ส่วนใหญ่จะเป็นการผ่าตัดอย่างเดียว โดยพบถึง 3 คน (33%) ที่หายอย่างสิ้นเชิง สำหรับการวิเคราะห์ตัวแปรเดี่ยว พบปัจจัยพยากรณ์โรคที่มีผลต่ออัตราการปลอดจากการกลับเป็นซ้ำของโรคอย่างมีนัยสำคัญทางสถิติ 2 ปัจจัย ได้แก่ ระยะของโรค และ optimal debulking ส่วนปัจจัยพยากรณ์โรคที่มีผลต่ออัตราการรอดชีพอย่างมีนัยสำคัญทางสถิติ พบมี 4 ปัจจัยได้แก่ ระยะของโรค, optimal debulking, การแตกของก้อน และการมีภาวะ ascites ปัจจัยอื่น ๆ ได้แก่ การผ่าตัดแบบ conservative, incomplete staging, การเลาะเอาต่อมน้ำเหลืองออก, periovarian adhesion, positive peritoneal cytology ไม่มีผลต่ออัตราการปลอดจากการกลับเป็นซ้ำของโรค และอัตราการรอดชีพอย่างมีนัยสำคัญทางสถิติ ส่วนปัจจัยพยากรณ์โรคแบบอิสระที่มีผลต่ออัตราการปลอดจากการกลับเป็นซ้ำของโรคและอัตราการรอดชีพไม่สามารถสรุปได้เนื่องจากมีอัตราการตายและอัตราการเป็นซ้ำของโรคต่ำ*

สรุป: *มะเร็งรังไข่ชนิด borderline มีการพยากรณ์ของโรคที่ดีมาก การผ่าตัดแบบ conservative น่าจะเหมาะสมสำหรับผู้หญิงในวัยเจริญพันธุ์ที่ยังต้องการมีบุตร และมีระยะของโรคเป็นระยะเริ่มต้น*