Endometrial Carcinoma with Synchronous Ovarian Malignancy-Differentiation between Independent and Metastatic Carcinomas

Shouji Kamikatahira,* Toshiko Jobo, and Hiroyuki Kuramoto

Department of Obstetrics and Gynecology, School of Medicine, Kitasato University, Kanagawa, Japan

Background: Among 167 patients with endometrial carcinoma, 21 (12.6%) appeared to have a concomitant ovarian malignancy. Three groups were defined by tumor histology. Group A was defined as endometrial and ovarian carcinomas of dissimilar histology. Group B was defined as both carcinomas with the same histologic type, but with benign and/or borderline malignant lesions adjacent to the ovarian malignancy. Group C was defined as the same carcinomas without benign or borderline lesions.
Methods: Based on these 3 groups the endometrial carcinomas with synchronous ovarian malignancies were analyzed histo- and clinico-pathologically.
Results: Four of the 21 cases (19.0%) were placed into group A, 7 of the 21 (33%) in group B, and 10 of the 21 (47.7%) in group C. Groups A and B, which were diagnosed as double primary cancers based on histological features, had a frequency of 52.4%, whereas group C, which was diagnosed as mostly metastatic, had a frequency of 47.6%. The highest frequency of deep myometrial invasion was found in group C. The highest incidence of lymph node metastasis was in group B. Enlarged ovaries with malignant lesions appeared in 100% of group A patients, in 88.9% of group B patients and in 16.7% of group C patients. In contrast, the frequency of normal-sized ovaries was highest in group C at 83.3%. There were no statistical differences in age, chief complaints and peritoneal cytology. The survival rates for groups A, B, and C were 75%, 66.7%, and 33.3%, respectively. The survival curve for group C was comparatively lower than those for groups A and B.
Conclusion: These data suggest that the histological findings of benign and/or borderline malignant lesions in ovarian tumors, in addition to ovarian size, are useful in the differentiation between independent and metastatic carcinomas of the endometrium.

Int J Clin Oncol 1996;1:100–108

Key words: endometrial carcinoma, double cancer, metastatic carcinoma, ovarian carcinoma, ovarian tumor of borderline malignancy

INTRODUCTION

Infrequent reports of endometrial carcinomas with synchronous ovarian carcinomas have been described elsewhere.[1–3] When the tumor histology is completely different, it is easy to diagnose double primary cancers. However, when the histology is the same, it is often difficult to judge whether the patient has a double primary cancer or metastatic cancer. Because such a decision greatly influences tumor staging and treatment, clear diagnostic criteria need to be established.

In this study, we classified endometrial cancer patients into 3 groups based on the tumor histology and the presence of benign or borderline malignant lesions in the ovary, and compared the pathological features of these groups. Clinical parameters, including the outcome of treatment, were also studied to determine if this classification could serve to differentiate between independent and metastatic carcinomas.

PATIENTS AND METHODS

Among the 167 women undergoing hysterectomy and bilateral salpingo-oophorectomy for the treatment of endometrial carcinoma between 1987 and 1993 in the Department of Gynecology at Kitasato University Hospital, 21 patients with synchronous malignant ovarian tumors, that included 1 borderline lesion of low malignancy potential (LPM), were enrolled as subjects. Chemotherapy was administered to the high risk patients.

The extirpated uterus was divided into at least 4 longitudinal parts, and the ovarian tumors were prepared from at least 2 cut surfaces that included the solid and cystic portions, and stained with hematoxylin and

Received Apr. 1, 1996; accepted for publication in revised form Apr. 30, 1996. *Correspondence and requests for reprints to: Department of Obstetrics and Gynecology, School of Medicine, Kitasato University, 1-15-1 Kitasato Sagamihara-shi, Kanagawa-ken 228, Japan.

1341-9625/96/0102-0100/US$3.00

eosin (H&E). The number of sections studied ranged from 10 to 42 (average, 23.5) for the uterus, and 1 to 22 (average, 5.5) for the ovaries.

The 21 patients were classified according to whether the uterine and ovarian lesions had the same histology. Those with different histological findings were placed into group A. Those patients with uterine and ovarian lesions showing the same histology were classified into group B if there were synchronous benign and/or borderline malignant lesions in the ovaries, and placed into group C if there were no associated benign or borderline lesions.

The 3 groups were compared with respect to the macroscopic and histopathological findings of lymph node metastasis, the depth of myometrial invasion of endometrial cancer, the ovarian size of the resected specimens, as well as peritoneal cytology and prognosis.

Statistical differences among the groups were assessed by the *t* test.

RESULTS

Among the 167 patients with endometrial cancer, 21 (12.6%) also had malignant tumors of the ovaries including 1 with LPM. Of these 21 patients, 4 were assigned to group A (19.0%), 7 to group B (33.3%), and 10 to group C (47.7%).

I. Macroscopic and Histopathological Findings

Five ovaries in group A (4 patients) showed evidence of malignancy, all were enlarged to at least 3.5 cm in size. Of the 9 ovaries that showed malignancy in group B (7 patients), 8 ovaries (88.9%) were enlarged. Malignancy was detected in 12 ovaries from group C (10 patients) and only 2 of these ovaries (16.7%) were enlarged.

Histopathological findings in group A

Adenocarcinoma, endometrial type was found in all endometrial carcinoma patients from group A. Two patients were classified as G2, and the remaining patients were classified as G1, and G3 (Table 1).

One patient had no myometrial invasion (25%), 2 had invasion in the middle third of the myometrium (50%), and 1 had infiltration extending beyond the serosa (25%). The tumor completely covered the endometrial surface in 2 patients (50%). Permeation to the vessels in the myometrium and invasion to the cervix was seen in 2 patients (50%). In 2 patients where lymph node dissection was performed, no metastases were found (Table 1). Patient number 4 had synchronous endometrial hyperplasia.

Malignancy was detected in 5 of the 8 ovaries in 4 patients from group A. Bilateral involvement was found in patient 3. The histology of the unilateral ovarian tumors in each of the patients was clear cell adenocarcinoma plus serous adenocarcinoma patient 1, Figs. 1, 2), mixed müllerian tumor (MMT), serous cystadenocarcinoma and mucinous cystadenoma LPM. The patient with bilateral involvement had serous cystadenocarcinoma. In patient 4, there was a mucinous tumor (LPM) on one side and a benign mucinous adenoma on the other side. Patients 3 and 4 had synchronous benign or borderline malignant lesions. The tumor was not limited to the ovarian surface in any of the patients.

All 5 ovaries with malignant findings were enlarged. The enlarged ovaries were solid in 2 patients, and showed a mixture of solid and cystic elements in the other 2 patients. The ovary with LPM was cystic (Table 2).

Histopathological findings in group B

In group B, G1 and G2 endometrial adenocarcinoma was seen in 2 patients, while G3 endometrial adenocarcinoma, adenoacanthoma, and serous adenocarcinoma were found in each of the remaining patients. Tumor invasion involved less than one-third of the myometrium in 4 patients (57.1%), more than two-thirds in 2 patients (28.6%), and reached the serosa in 1 patient (14.3%). Vessel permeation in the myometrium

Table 1. Group A: Histological findings of endometrial carcinomas.

Patient	Histology	Size (cm)	Depth of invasion	Vessel permeation	Lymph node metastasis	Cervical involvement	Location of tumor
1	Adeno-carcinoma (G2)	8.5 × 13	serous	+	ND	+	entire surface
2	Adeno-carcinoma (G2)	10 × 10	1/3–2/3	+	–	–	1/3 of endometrial surface, coexistant with normal endometrium
3	Adeno-carcinoma (G3)	9 × 12	1/3–2/3	–	–	+	entire surface
4	Adeno-carcinoma (G1)	8.3 × 7	noninvasive	–	ND	–	1/20 of endometrial surface, coexistant with endometrial hyperplasia

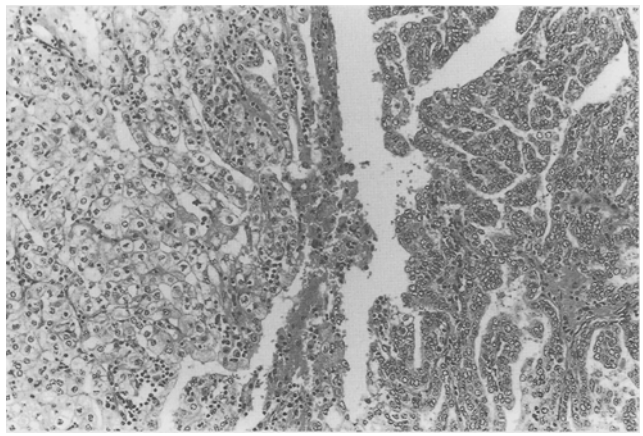

Fig. 1. Group A, patient 1. Ovarian tumor: clear cell carcinoma (left side), and serous carcinoma (right side). H&E; original magnification, 4 × 4.

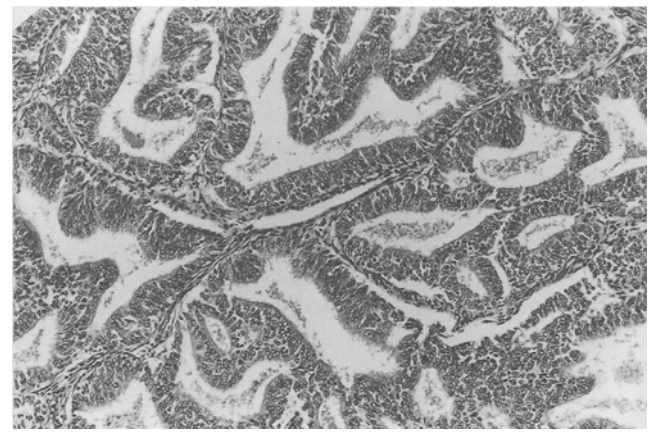

Fig. 2. Group A, patient 1. Endometrial carcinoma: endometrioid adenocarcinoma G2. H&E; original magnification, 4 × 10.

Table 2. Group A: Macroscopic and histological findings of ovarian carcinomas.

Patient	Size (cm)	Macroscopic findings	Histology	Coexistance with benign/LPM	Development of tumor
1	rt 7 × 6.5	solid	clear cell carcinoma + serous carcinoma	–	no tumor on the external surface, capsule intact
	lt 2.5 × 1.5 × 1	normal	normal		—
2	rt 2.5 × 3	normal	normal		—
	lt 13 × 13.5 × 8	solid	mixed müllerian tumor	–	no tumor on the external surface, multiple peritoneal metastasis
3	rt 4 × 3.8	solid, partially cystic	serous carcinoma	+	no tumor on the external surface, capsule intact
	lt 6.5 × 6	solid, partially cystic	serous carcinoma	+	tumor on the external surface
4	rt 6 × 4.5	cystic	mucinous adenoma (LPM)		small papillary projection into the cyst cavity, capsule intact
	lt 3.2 × 3.2	cystic	mucinous adenoma	+	—

LPM, low malignancy potential.

was seen in 2 patients and invasion to the cervix was found in 4 (57.1%). In 6 patients who underwent lymph node dissection, metastasis was found in 3 patients (50.0%) with at least two-thirds infiltration of the myometrium. In 4 of the 7 patients (57.1%) the tumor extended over the entire endometrial surface. Synchronous endometrial hyperplasia was seen in 2 patients (Table 3).

Malignancy was detected in 9 of the 14 ovaries removed from the 7 patients in group B (Figs. 3, 4). In 2 of the group B patients bilateral malignancies were found (28.6%, patients 2 and 4). Infiltration of the carcinoma was only seen in the left ovary of patient 4; but a borderline malignant lesion was found adjacent to a malignancy in the larger right ovary. In patient 1, a dermoid cyst (18 × 7 × 5 cm) was present in the opposite ovary.

During the pathological examination, only 2 ovaries in group B patients were associated with benign tumors (25%). Three ovaries in group B patients were associated with borderline malignant tumors (37.5%), and 3 ovaries were associated with both benign and borderline malignant tumors (37.5%).

All of the malignant ovaries were enlarged, except for the left ovary in patient 4. All lesions were either solid or occupied by a mixture of solid and cystic components (Table 4).

Histopathological findings in group C

In the 10 patients in group C, there were 4 G1, 2 G2, and 2 G3 endometrial adenocarcinomas. One patient had a serous adenocarcinoma and another had a mixed MMT. The extent of myometrial invasion exceeded

Table 3. Group B: Histological findings of endometrial carcinomas.

Patient	Histology	Depth of invasion	Vessel permeation	Lymph node metastasis	Cervical involvement	Location of tumor
1	Adenocarcinoma (G2)	less than 1/3	–	ND	+	entire surface
2	Serous carcinoma	more than 2/3	+	+	+	entire surface
3	Adenocarcinoma (G1)	less than 1/3	–	–	–	1/20 of endometrial surface, coexistant with hyperplasia
4	Adenocarcinoma (G3)	more than 2/3	–	+	–	entire surface
5	Adenocarcinoma (G1)	serosa	–	+	+	3/4 of endometrial surface (fundus and lower segment), coexistant with normal endometrium
6	Adenocarcinoma (G2)	less than 1/3	–	–	+	entire surface
7	Adenoacanthoma	less than 1/3	–	–	–	3/4 of endometrial surface, coexistant with hyperplasia

ND, not dissected.

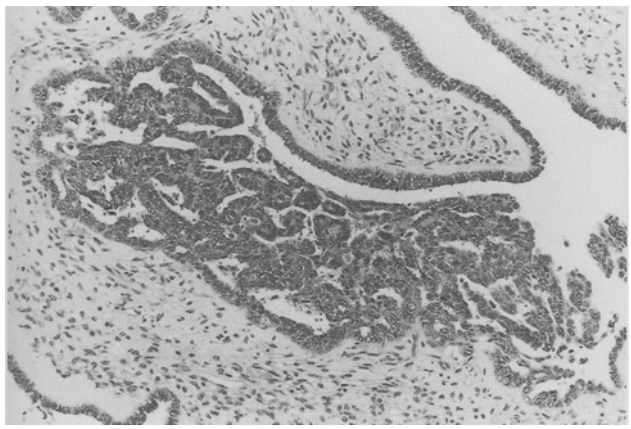

Fig. 3. Group B, patient 2. Ovarian tumor: serous adenocarcinoma and benign serous adenoma in the adjacent area. H&E; original magnification, 4 × 4.

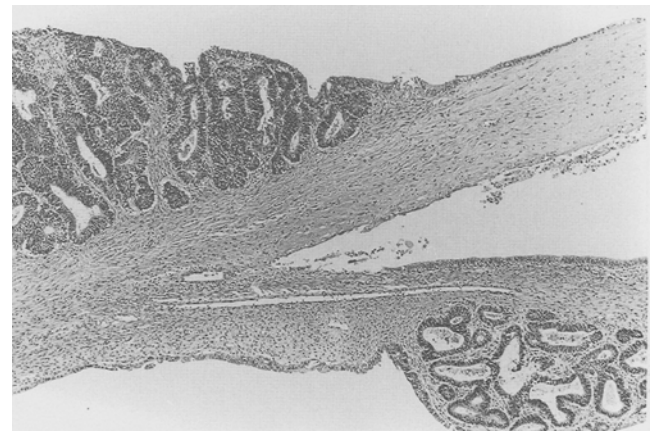

Fig. 4. Group B, patient 6. Ovarian tumor: endometrioid carcinoma and its tumors (benign and LPM) in the adjacent area. H&E; original magnification, 4 × 10.

one-third in all patients. In 5 patients the myometrial invasion was two-thirds (50.0%), and over two-thirds in 1 patient (10.0%). Invasion that extended to the serosa was found in 4 patients (40.0%). Vessel permeation in the myometrium was seen in 3 patients (30.0%) and invasion to the cervix was detected in 6 patients (60.0%). Metastasis was found in 2 of the 6 patients (33.3%) who underwent lymph node dissection (Table 5). The tumor extended across the entire endometrium in 4 patients (40.0%) and was localized to less than one-tenth of the endometrial surface in 2 patients (20.0%). However, these 2 patients had progressive disease with cervical or uterine serosa involvement (patients 4 and 8). Synchronous endometrial hyperplasia was seen in 2 patients (20.0%).

Two patients had undergone unilateral oophorectomy previously. Eighteen ovaries were resected in 10 patients, of these, malignancy was found in 12 (66.7%), and in 2 patients (25%) bilateral lesions were discovered. In case 4, a chocolate cyst of endometriosis was present in the opposite ovary.

Among the 12 ovaries with malignant lesions, 2 ovaries were solid and enlarged (16.7%), and 10 (83.3%) were of normal size. Carcinoma was present in 66.6% of the normal-sized ovaries. The ovaries of the 2 patients with bilateral malignancy were of normal size.

Among the 10 ovaries that were macroscopically normal, 7 showed slight tumor infiltration into the ovarian parenchyma (patient 5, Fig. 5) and 3 showed diffuse parenchyma infiltration. The 2 enlarged ovaries showed extensive diffuse infiltration of the parenchyma (Table 6).

II. Clinicopathological Findings

The age distribution in groups A, B, and C was 38–80

Table 4. Group B: Macroscopic and histological findings of ovarian carcinomas.

Patient	Size (cm)	Macroscopic findings	Histology	Coexistance with benign/LPM	Development of tumor
1	rt 18 × 18 × 13	solid partially cystic	Endometrioid carcinoma (G2)	–/+	no tumor on the external surface, capsule intact
	lt 18 × 7 × 5	cystic	dermoid cyst		—
2	rt 4.5 × 2.5 × 2.5	normal ovary, partially cystic	serous carcinoma	+/+	no tumor on the external surface, artificial rupture of the capsule
	lt 12 × 7 × 5	cystic, partially solid	serous carcinoma	+/+	
3	rt 3 × 1.5 × 1.5	normal	normal		—
	lt 3.5 × 2 × 2	solid	Endometrioid carcinoma (G1)	+/–	tumor on the surface, and parenchyma
4	rt 9 × 4.5 × 1.5	cystic, partially solid	Endometrioid carcinoma (G3)	–/+	diffuse parenchymal nodular lesions
	lt 2.1 × 1.9 × 1.5	normal	Endometrioid carcinoma (G3)	–/–	tumor on the surface, parenchymal invasion
5	rt 9 × 4.7	cystic, partially solid	Endometrioid carcinoma (G1)	+/+	wide lesion in parenchyma
	lt 3.8 × 2.8 × 1.9	solid	normal		—
6	rt atrophic	normal	normal		—
	lt 10 × 10	cystic, partially solid	Endometrioid carcinoma (G2)	–/+	no tumor on the external surface, artificial rupture of the capsule
7	rt 4 × 2	normal	normal		—
	lt 7.5 × 8	cystic, partially solid	Endometrioid carcinoma (G1)	+/–	no tumor on the external surface, artificial rupture of the capsule

LPM, low malignancy potential.

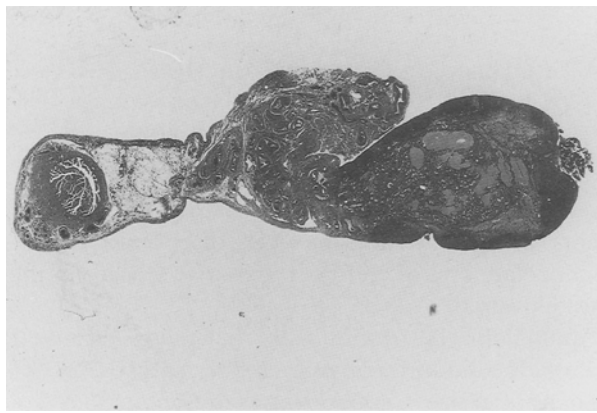

Fig. 5. Group C, patient 5. Left ovary with the implant of endometrioid carcinoma on an ovarian surface (arrow). Loupe magnification.

years, 35–55 years, and 41–63 years, respectively. The median ages were 50.5, 47.6, and 58.0 years, respectively. There were no significant differences in age between the groups.

Atypical vaginal bleeding was the chief complaint in 2 of the 4 patients (50%) from group A, 5 of the 7 patients (71.4%) from group B, and 7 of the 10 patients (70.0%) from group C. Other complaints were abdominal distention in 1 patient from group A and 2 patients from group B, and an abdominal mass in 1 patient from group C.

Ascites was observed in 3 patients (75.0%) from group A, 5 (71.4%) from group B, and 4 (40.0%) from group C. However, the amount of ascites only exceeded 500 mL in 1 patient from group A and 1 from group B. Peritoneal cytodiagnosis was performed in all patients and positive findings were found in 2 patients (50%) from group A, 3 (42.9%) from group B, and 6 (60.0%) from group C.

When survival curves were prepared by the Kaplan-Meier method for groups A, B, and C (Fig. 6), survival tended to be lower in group C than in the other groups, but the difference was not statistically significant. The survival rates of the 3 groups as of October 1995 were 75%, 66.7%, and 33.3%, respectively. The prognosis was unclear for 2 of the group C patients.

The cause of death or the site of recurrence in patients who died was carcinomatous peritonitis in 1 patient from group A, brain metastasis and vaginal

Table 5. Group C: Histological findings of endometrial carcinomas.

Patient	Histology	Depth of invasion	Vessel permeation	Lymph node metastasis	Cervical involvement	Location of tumor
1	Adenocarcinoma (G2)	1/3–2/3	–	ND	–	entire surface
2	Serous adenocarcinoma	1/3–2/3	–	ND	–	1/2 of endometrial surface (fundus and middle segment), coexistant with normal endometrium
3	Adenocarcinoma (G1)	1/3–2/3	–	–	+	1/5 of endometrial surface, coexistant with hyperplasia
4	Adenocarcinoma (G1)	1/3–2/3	–	–	+	1/10 of endometrial surface, coexistant with hyperplasia
5	Adenocarcinoma (G2)	1/3–2/3	–	–	–	3/4 of endometrial surface, coexistant with normal endometrium
6	Adenocarcinoma (G1)	serosa	+	+	+	entire surface
7	Adenocarcinoma (G3)	more than 2/3	+	–	–	entire surface
8	Mixed müllerian tumor	serosa	–	+	+	1/10 of endometrial surface, coexistant with normal endometrium
9	Adenocarcinoma (G1)	serosa	–	ND	+	1/4 of endometrial surface, coexistant with normal endometrium
10	Adenocarcinoma (G3)	serosa	+	ND	+	entire surface

ND, not dissected.

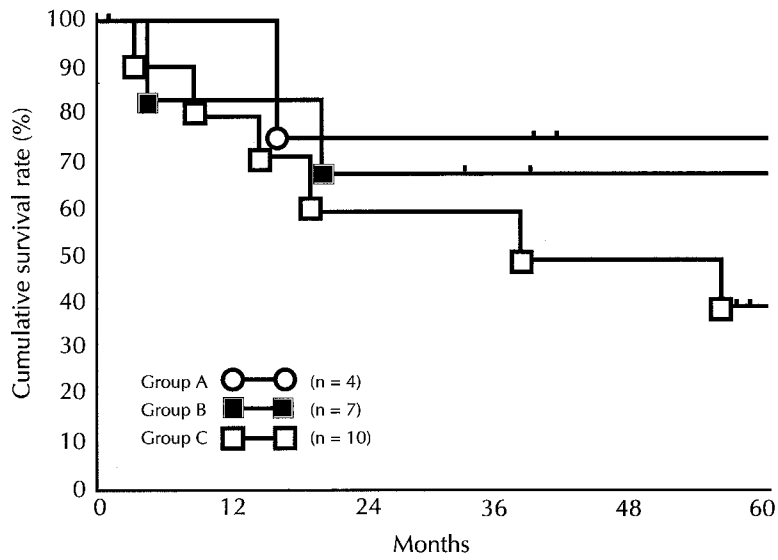

Fig. 6. Survival curves for group A, B and C (Kaplan-Meier).

Table 6. Group C: Macroscopic and histological findings of ovarian carcinomas.

Patient	Size (cm)	Macroscopic findings	Histology
1	rt 2.7 × 1.8 × 0.7	normal	normal
	lt 9 × 9 × 3	solid	endometrioid carcinoma (G2), diffuse parenchymal invasion
2	rt 1.9 × 1.5	normal	normal
	lt 1.9 × 2.2	normal	serous adenocarcinoma, on the surface with parenchymal invasion (5 cm in diameter)
3	rt 2.5 × 1.5 × 1.5	normal	normal
	lt 2 × 1.5 × 1.5	normal	endometrioid carcinoma (G1), tumor on the surface with small parenchymal invasion
4	rt 2 × 1.9 × 0.7	normal	endometrioid carcinoma (G1), diffuse parenchymal invasion
	lt 4.7 × 3.2 × 2	cystic	chocolate cyst
5	rt 3.2 × 2 × 1.2	normal	normal
	lt 2.5 × 1.7 × 0.9	normal	endometrioid carcinoma (G2), tumor on the surface with small parenchymal invasion
6	rt 10 × 8 × 8	solid, partially cystic	endometrioid carcinoma (G1), multinodular lesions with parenchymal invasion
	lt post-ovariectomy		
7	rt 3.5 × 1	normal	normal
	lt 2.5 × 1	normal	endometrioid carcinoma (G3), small lesion on the surface
8	rt 1.5 × 0.7 × 0.7	normal	mixed müllerian tumor, diffuse parenchymal invasion
	lt 2.8 × 2.5 × 2.2	normal	mixed müllerian tumor, diffuse parenchymal invasion
9	rt 2.3 × 1.6 × 1.5	normal	endometrioid carcinoma (G1), tumor on the surface (7 cm in diameter)
	lt 3 × 2 × 1	normal	endometrioid carcinoma (G1), tumor on the surface with shallow invasion
10	rt atrophic	normal	endometrioid carcinoma (G2), small multifocal invasions
	lt post-ovariectomy		

stump recurrence in 1 patient each from group B, lung metastasis in 2 patients, liver metastasis in 1 patient, and lymph node metastasis in 1 patient from group C. The details of the site of recurrence were unclear for 2 patients in group C.

DISCUSSION

Synchronous malignant tumors of the uterus and ovaries are not that rare.[1–8] The incidence of synchronous ovarian carcinoma in patients with carcinoma of the endometrium has been reported to be 0.8–3.7%, while the incidence of synchronous endometrial carcinoma in patients with carcinoma of the ovary is 0.6–5.5%. In patients with endometrial carcinoma and synchronous ovarian carcinoma, the incidence of endometrioid adenocarcinoma is reported most frequently, followed by serous adenocarcinoma.[5,6,9,10] However, the malignant ovarian tumor that shows the highest rate of synchronous development with endometrial carcinoma is endometrioid carcinoma, and the reported incidence ranges from 12.4% to 33.3%.[6,7,11–13] Russell et al.[7] reported that endometrial carcinoma was present in 2.7% of the 75 cases with serous adenocarcinoma of the ovary. The incidence of associated endometrioid carcinoma of the ovary was high (33.3% of cases).

The concept of a secondary müllerian system, proposed by Lauchlan,[14] has attracted attention as the potential cause for this high rate of synchronous endometrial and ovarian carcinoma. The epithelium of the ovarian surface is closely related to müllerian duct epithelium in the embryonal period, and may respond in a similar manner to carcinogens as the müllerian duct-derived endometrium. Eifel et al.[15] analyzed cases of synchronous endometrial and ovarian carcinoma from this point of view and Russell et al.[7] noted multifocal tumorigenesis in the female upper genital tract.

The diagnosis of synchronous endometrial and ovarian carcinomas is a problem because it is difficult to decide whether there are 2 independent tumors (i.e., double primary cancers), or whether there is a metastasis from one organ to the other. To determine whether an

ovarian tumor is a metastasis or a double primary cancer is difficult, especially when the ovarian tumor is an endometrioid carcinoma.

When there are lesions in the ovaries of patients with endometrial carcinoma, the staging classification is stage III if the patient does not have a double primary cancer. In such patients, the prognosis is usually poor and additional therapy is required. Stage II ovarian carcinomas are diagnosed if the endometrial lesions are considered to be metastases from the ovaries. Likewise, in patients with 2 stage I carcinomas, which originated separately, stage progression can result in major changes to the treatment strategy if either of the carcinomas is not distinguished from a metastasis.

There are reports that indicate prognosis is generally good, both in patients with endometrial-type-adenocarcinomas of the uterine corpus, and endometrioid carcinomas of the ovary.[7,13,15] Eifel et al.[15] reported that additional therapy, other than surgery, is not required for localized endometrioid carcinomas of the endometrium and ovary, if the histological grade for both is I.

The number of patients with both endometrial and ovarian carcinomas has increased in recent years. There is a need to clearly define metastatic carcinomas and double primary cancers for the improvement of therapeutic outcomes.

The oldest definition of "double cancer" is that of Billroth.[16] However, the following definition involving 3 conditions based on an analysis of 1078 autopsy cases by Warren and Gates[17] is most often used: (1) Each of the cancers shows definite malignancy. (2) They occupy completely separate sites. (3) It can be proven that there is no metastasis from the other tumor.

The following points have been raised by various investigators in the evaluation of malignant tumors of the endometrium and ovaries: (1) When there is a malignant lesion of the endometrium associated with synchronous endometrial hyperplasia, the diagnosis is carcinoma of the uterine body.[18] (2) When there are multiple cancer foci in the ovaries, the diagnosis is likely to be metastasis.[18,19] (3) When the ovarian tumor is small, there is a high possibility of metastasis.[18,19] (4) When ovarian tumors are bilateral, there is a high possibility of metastasis.[18,19] (5) When the endometrial lesions show deep myometrial invasion, there is a high possibility of metastasis to the ovaries.[18,19] (6) When there is vessel permeation in the endometrial lesion, there is a high possibility of metastasis to the ovaries.[18,19] (7) When there are tumor cells in the oviducts, there is a high possibility of metastasis to the ovaries.[4,18] (8) If the histology of both the endometrial and ovarian tumors is endometrioid adenocarcinoma, there is a high possibility of a "double cancer".[15,20] (9) When there are no precancerous lesions in the ovaries, there is a high possibility of ovarian metastasis.[19] (10) If the ovarian lesion is contiguous with endometriosis, the probable diagnosis is primary ovarian carcinoma.[19,21]

We studied 21 patients with endometrial carcinoma and synchronous ovarian carcinoma. We classified them into 3 groups in accordance with histological differences and the presence of synchronous benign ovarian tumors and/or LPM.

The primary evaluation standard for benign lesions in ovarian tumors is based on evidence that many cases of endometrial carcinomas have synchronous endometrial hyperplasia as a precancerous lesion.[22] As defined earlier by Warren and Gates,[17] the 4 patients in group A can be clearly diagnosed with double cancers. However, there is a problem when the histology of both tumors is the same. Eifel et al.[15] reported that endometrioid adenocarcinoma, that exists both in the ovary and the endometrium, was defined as "double cancer", but there are also cases of definite metastasis.

We classified our cases into groups A, B, and C depending on the presence of synchronous benign lesions in the ovaries, and obtained the following results: (1) In group B, at least 1 of the ovaries was enlarged similar to group A; while in 75% of group C patients both ovaries were of normal size and 83.3% of the malignant ovaries were of normal size. (2) Only group C showed lesions on the surface of the ovaries and a few lesions in the parenchyma. (3) More patients in group C than in group B showed cancer invasion of at least two-thirds of the uterine myometrium.
(4) The prognosis in group B was comparatively better than in group C. These results suggest that group B has "double cancer" and group C has metastasis of endometrial cancer to the ovaries.

The above results indicate that the evaluation criteria based on (1) the histology of the endometrial and ovarian lesions, and (2) the coexistence of any benign or borderline malignant lesion in the ovary are suitable for distinguishing double primary cancers from metastatic carcinomas.

Among the patients with malignancy, enlargement of one or both ovaries was seen in 100% of group A, 88.9% of group B, and 16.7% of group C. The incidence of ovarian enlargement was high in groups A and B, which were diagnosed with double primary cancers, suggesting the possibility that ovarian size may also be useful for differentiation. In group C, for patients meeting these criteria, a more intensive therapeutic strategy is necessary due to their poor prognosis.

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