Squamous Cell Carcinoma of the Ovary
— A Case Report —

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Summary: A 68-year-old woman presented a one-month history of lower abdominal pain and weight loss, and was admitted to our hospital. On physical examination, a large hard mass was palpated in her right lower abdomen. An ultrasonograph and computed tomographic (CT) scan revealed a right ovarian tumor that measured 6.9×4.9 cm in size. A total hysterectomy and bilateral salpingo-oophorectomy were performed. The postoperative diagnosis of the tumor was squamous cell carcinoma (SCC) of the ovary. She died of infection and disseminated intravascular coagulation 5 months after surgery. The clinical and autopsy examinations did not show the primary lesion of SCC except in the right ovary. Mature cystic teratoma, Brenner tumor and endometriosis, which are ordinary regarded as the histogenesis of ovarian SCC, were not found, but a few surface epithelial inclusion cysts with squamous metaplasia were observed in non-cancerous area of the right ovary, and the contiguous transition from the metaplastic cyst wall to SCC was confirmed by stepwise serial sections. The present case suggests that the surface epithelium of ovary could be the fourth possibility in the histogenesis of the ovarian SCC.

Key words: ovary — ovarian cancer — surface epithelial inclusion cyst — squamous metaplasia — squamous cell carcinoma

Introduction

Primary squamous cell carcinoma (SCC) of the ovary is rare, and only few cases have been reported. As to the histogenesis of this tumor, malignant transformations of a mature cystic teratoma (Kionsky et al. 1972; Sivanesaratnam and Lee, 1972; Kaplan, 1977; Gabrielli et al. 1984; Tang et al. 1984; Hirakawa et al. 1989), Brenner tumor (Idelson, 1963; Miles and Norris, 1972; Seldenrijk et al. 1986; Tang and Kang, 1990) or endometriosis (McCullough et al. 1946; Lele et al. 1978; Chen and Weilert, 1982; Tetu et al. 1987; Naresh et al. 1991) have been considered. The most common origin of this tumor is either mature cystic ter-
ataoma or Brenner tumor. Few cases of SCC originating from ovarian endometriosis have been reported. However, some cases, in which the histogenesis cannot be determined, have also been reported (Shinglenton et al. 1974; Marco and Johnson, 1983; Chen, 1988; Radhi and Awad, 1990), suggesting de novo occurrence of SCC in the ovary.

We present a case of primary ovarian SCC in which the tumor is considered to have originated from the ovarian surface epithelium with squamous metaplasia.

Case Report

A 68-year-old Japanese woman presented a one-month history of lower abdominal pain and weight loss, and was admitted to the Kurume University Hospital in October, 1993. At admission, a large hard mass was palpated in her right lower abdomen. An ultrasonograph and computed tomographic (CT) scan of the abdomen and pelvis revealed a right adnexal tumor that measured 6.9 × 4.9 cm in size and was composed of two areas with different density. One was cystic and the other was solid. The solid part was irregularly enhanced by intravascular contrasted CT scan. The margin of the tumor was ill-defined and the right ureter was dilated due to the tumor extension to the surrounding tissue. Tumor markers, such as cancer antigen 125, alpha-fetoprotein, carcinoembryonic antigen and carbohydrate antigen 19-9, were within normal limits. There were no abnormalities in the vagina and the uterine cervix. No atypical cells were found by the exfoliative cytology of uterine cervix and endometrium.

Clinically, she was diagnosed as having a primary ovarian cancer classified stage IIIc (International Federation of Gynecology and Obstetrics [FIGO] classification). A total hysterectomy and bilateral salpingo-oophorectomy were performed on October 22, 1993.

At operation, the right ovary was completely replaced by the tumor, and the right fallopian tube and omentum were also involved. Complete tumor resection was impossible because of tumor extension to the rectum, the sigmoid colon and the sacred bone. Serum squamous cell carcinoma antigen level immediately after the surgery was 83.8 ng/ml (normal: below 1.5 ng/ml). She received 4 cycles of combination chemotherapy consisting of Bleomycin, Cisplatin, Vinblastin and Mitomycin C, but her general condition deteriorated due to the rapid tumor growth. She died of infection and disseminated intravascular coagulation on March 28, 1994, and an autopsy was performed.

Pathologic findings

Resected tumor: Grossly, the right ovary was replaced by a gray-whitish tumor of

![Fig. 1. Gross finding of the tumor. Right ovary was enlarged and the surface was irregular. Uterus, left ovary and fallopian tube were intact.](image-url)
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Fig. 2. Histological finding of the tumor. a: The tumor was composed of solid sheets of polygonal cells. (hematoxylin and eosin, ×40) b: Pearl formation and intercellular bridge were observed in the tumor. (hematoxylin and eosin, ×200)

Fig. 3. Inclusion cyst with squamous metaplasia (hematoxylin and eosin, ×25) Inset: High power view of metaplastic squamous epithelium (hematoxylin and eosin, ×200)

10×12×8 cm in size. The surface of the tumor was irregular and tumor invasion of the surrounding connective tissue was prominent. The uterus, left ovary and fallopian tubes were found to be normal (Fig. 1).

Histologically, the tumor of the right ovary was composed of a proliferation of polygonal cells arranged in a sheet pattern with keratinization (Fig. 2). A few surface epithelial inclusion cysts, which were lined by a single layer of columnar epithelium with squamous metaplasia in part, were found in the
ovarian cortex where the tumor did not infiltrate (Fig. 3). Stepwise serial sections disclosed that the tumor nests were contiguous to the epithelium of inclusion cyst showing squamous metaplasia (Fig. 4). The tumor was diagnosed as well-differentiated squamous cell carcinoma arising from the epithelium of surface inclusion cysts with squamous metaplasia. There was no tumor involvement in the uterine cervix and endometrium.

Autopsy findings
At autopsy, the residual tumor invaded the right ureter, rectum, ileum and vesicovaginal septum, with metastases to the mesenteric and iliac lymph nodes. There was no evidence suggestive of the possibility that SCC primarily occurred in other organs.

Discussion
Ovarian cancer has a great variety of histological types, but SCC in the ovary is rare. Most reported cases are metastatic SCC to the ovary, which account for a mere 2.5% of ovarian metastases (Webb et al. 1975). Of these, most cases are metastatic tumors from the uterine cervix.

Primary SCC of the ovary usually arises from cystic teratoma and Brenner tumor. Hirakawa et al. (1989) reported 28 cases of SCC arising from mature cystic teratoma and described that SCC did not originate from a direct transition from the ordinary epidermis of the teratomatous skin tissue but from a columnar epithelium or from a metaplastic squamous epithelium. Among 10 cases of ovarian SCC reported by Kashimura et
al. (1989), 3 were not associated with cystic teratoma, but squamous metaplasia of glandular epithelium was present in 2 of them. Tang and Kang (1990) studied 6 SCCs arising in Brenner tumors, ultrastructurally, and described that the histologic features of the tumors resemble those of nonkeratinized SCC of the uterine cervix. Ultrastructural features included numerous desmosome-tonofilament complexes, specific for the squamous epithelium. In general, transitional cell carcinoma, adenocarcinoma, SCC or a mixture of them are common histologic features in malignant Brenner tumor. Their study may support the possibility that SCC arising in Brenner tumor is also related to surface epithelium with squamous metaplasia.

To our knowledge, only 5 cases of primary SCC associated with endometriosis have been reported (McCullough et al. 1946; Lele et al. 1978; Chen and Weilert, 1982; Tetu et al. 1987; Naresh et al. 1991). As the transition between benign endometriosis and carcinoma was proven only in 2 cases (Lele et al. 1978; Chen and Weilert, 1982). Extensive sampling is mandatory to clarify the origin in advanced cases.

Four de novo ovarian SCC have been reported (Shinglenton et al. 1974; Marco and Johnson, 1983; Chen, 1988; Radhi and Awad, 1990), and 2 of them (Shinglenton et al. 1974; Chen, 1988) were associated with carcinoma in situ of the uterine cervix. This may suggest that careful observation by multiple sections is necessary to rule out the possibility of metastasis to the ovary from microinvasive carcinoma in the cervix.

In the present case, mature cystic teratoma, Brenner tumor, and endometriosis were not found, but inclusion cysts with metaplastic squamous epithelium were found. Further, a contiguous transition between the tumor nests and the metaplastic epithelium was confirmed. Thus, it is strongly suspected that the present case might be malignant transformation of the inclusion cyst with squamous metaplasia. Scully (1982) reported a case of primary ovarian SCC which had arisen from the ovarian surface epithelium with Müllerian differentiation. In general, the inclusion cyst of the ovary is lined by columnar epithelium of mesothelial origin. Thus, it is suggested that the surface epithelium of the ovary could be also one of the origin of SCC.

References


