Primary ovarian leiomyosarcoma associated with Brenner tumor

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Summary

Background: Primary ovarian leiomyosarcoma (POL) is rare. To the best of our knowledge, POL associated with a Brenner tumor has not been previously documented. *Case:* A case of POL associated with a Brenner tumor is reported. Although the poorly differentiated component of the tumor was negative for SMA, the presence of spindle cells in the higher differentiated component with fascicle arrangement and immunoreactivity for SMA and strong staining of a poorly differentiated component for desmin and vimentin established the diagnosis. *Conclusion:* This case indicates that since malignant tumor cells may lose some antigen markers, thorough sampling and immunohistochemistry are necessary. EMA-immunopositivity only could not preclude the diagnosis of leiomyosarcoma.

Key words: Primary ovarian leiomyosarcoma; Brenner tumor; SMA; EMA.

Introduction

Primary leiomyosarcoma of the ovary is extremely rare, accounting for 0.1% of ovarian malignancies, with less than 50 cases documented in the literature [1, 2]. We report a unique case of leiomyosarcoma with associated Brenner tumor which has not been reported before.

Case Report

A 71-year-old postmenopausal woman presented with a painless abdominal mass and weight loss. The palpable mass was noticed five months before and was rapidly growing. Physical examination revealed a large mass with its upper pole near the inferior aspect of the umbilicus. Color Doppler sonography showed solid masses in the bilateral adnexal areas and cul-de-sac. CA125 was 120.2 U/ml (3 U/ml is within normal values), and other serum tumor markers including CEA, AFP, CA199 were normal. The patient underwent an ovarian mass biopsy and the frozen section was diagnosed as malignant tumor. Total abdominal hysterectomy and bilateral salpingo-oophorectomy, omentectomy, bilateral pelvic lymph nodes sampling, peritoneal and pelvic wall biopsy were performed. No adjuvant chemoradiotherapy was administered. One week after the initial surgery, the patient accumulated a massive amount of ascites. She died of widespread metastasis one and a half months after the initial surgery.

Grossly, the left ovarian mass was greyish white, irregularly shaped, and 15x10x10 cm in size. The cut surface was solid, moderately firm to soft, with scattered areas of hemorrhage and necrosis. Many nodules appeared in the omentum, sarosa of the uterus, and peritoneal and pelvic walls, with a soft and greyish white appearance on the cut. The right ovary appeared grossly normal.

Microscopically, there were three forms of its component in the left ovary. The main part of the tumor was highly cellular and poorly differentiated. It was composed of highly pleomorphic tumor cells with a diffuse pattern of growth where necrosis and numerous mitoses (25~30/10 HPF) were prominent. The cells were typically composed of eosinophilic cytoplasm. Nuclei were round, ovoid or bizarre with hyperchromatism. Vascular involvement was present. Another part of the tumor was more highly differentiated than the above one. Cells in these areas were less atypical and moderately hypercellular, showing fascicle arrangement. The nuclei were spindle, blunt-ends with abundant eosinophilic cytoplasm. The mitotic index was 2~5/10 HPF and the necrosis was inconspicious. Some area of the tumor showed two cystic nests of transitional type epithelium surrounded by spindle cells. No cytological atypia nor mitoses appeared. Metastatic tumor cells in the omentum, sarosa of the uterus, peritoneal and pelvic walls and the surface of the right ovary were similar to those of cells in the poorly differentiated component of the left ovary.

Immunohistochemically tumor cells in the area of the more highly differentiated component expressed strongly positive for SMA (Figure 1) and caldesmon. The tumor cells in the areas of the poorly differentiated component were strongly reactive for desmin and vimentin (Figure 2) and weakly reactive for EMA and negative for SMA, caldesmon, myoglobin, CK, and MYoD1. Cells in the transitional-type epithelium were CK-positive (Figure 3).

The pathological diagnosis was left primary ovarian leiomyosarcoma (POL) associated with a microscopic Brenner tumor. Leiomyosarcoma involved the omentum, the biopsy of peritoneal and pelvic walls, serosa of the uterus and the surface of the right ovary.

Conclusion

POL is an aggressive neoplasm with a poor prognosis. The entity is often present in advanced stage. More than 50% of patients die or develop recurrent disease within 54 months after the initial surgery. Most cases have occurred in postmenopausal, women and approximately 80% were unilateral. Premenopausal women, and those with early stage and no residual disease after surgery may have a more favorable outcome. The benefit of adjuvant treatment is controversial because of its rarity. Eighty percent of patients with surgery and radiation therapy and 60% of

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Fig. 1

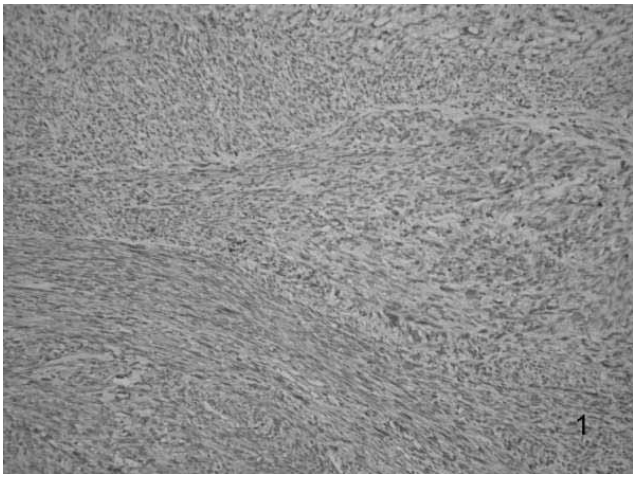

Fig. 2

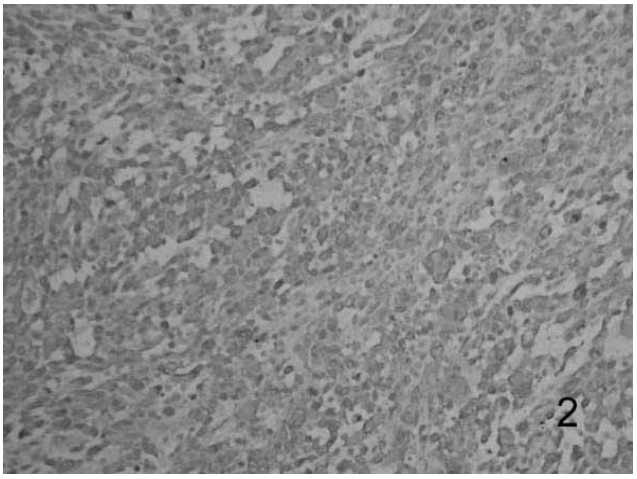

Fig. 3

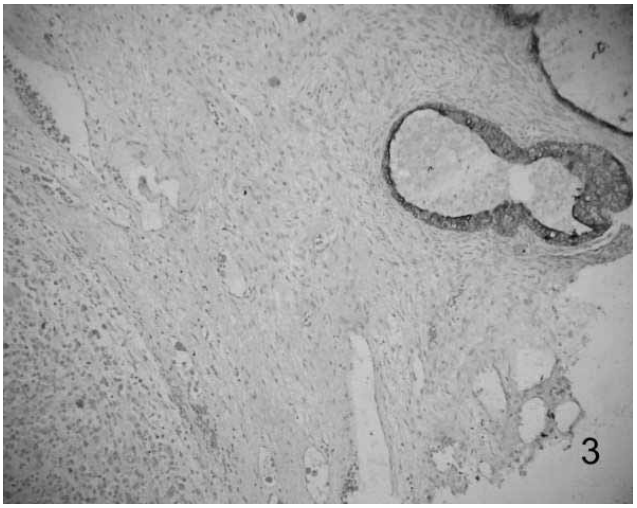

Figure 1. — Highly differentiated component of leiomyosarcoma showing strong immunoreactivity for SMA (x 100).

Figure 2. — Poorly differentiated component revealing strong immunostaining for desmin (x 100).

Figure 3. — Brenner tumor (on the right) showing immunoreactivity for CK. Note the leiomyosarcoma (on the lower left) showing hypercellularity and pleomorphism (x 100).

patients with surgery and chemotherapy died, while 40% died with surgery only. The majority of living patients had no residual disease after the initial surgery [1-5].

The origin of smooth muscle cells in POL is similar to that of ovarian leiomyoma: 1) Smooth muscle wall of blood vessels in the cortical stroma [6]. In our case, there was no evidence to prove this theory because the neoplastic cells were not arranged around the blood vessels. 2) Smooth muscle cells in the ligaments close to the ovary. Our case did not show the leiomyosarcoma in this region. 3) The smooth muscle component of the associated teratoma. Our case was not associated with teratoma. 4) Ovarian mesenchyme. It is widely accepted that the cells in the mesenchyme retain the capability of developmental potency [7]. The smooth muscle cells in our case may have originated from the mesenchyme.

Brenner tumors are relatively rare neoplasms accounting for 1-2% of all ovarian neoplasms. Most patients are between 30 and 60 years old. The relationship between Brenner tumor and POL remains to be elucidated.

Interestingly, the poorly differentiated component of POL was weakly EMA-positive and SMA/caldesmon-negative. A study by Iwata and Fletcher [8] demonstrated 44/100 cases of EMA-positive leiomyosarcomas (focal or diffuse). They regarded it as random and disorganized events happened in the leiomyosarcoma. The negativity for SMA and caldesmon might suggest that the poorly differentiated component occasionally lost some antigen marker that is classical of a highly differentiated component. The reactivity of these tumor cells to desmin, vimentin and the expression of SMA and caldesmon in the higher differentiated component may help in facilitating the diagnosis. Moreover, it should be emphasized that depending on the results of immunoreactivity for one single antibody may not be trustworthy. A panel of antibodies, careful morphological examination and thorough histologic sampling will offer a more confident diagnosis. This immunohistochemical phenomenon has not been described in other ovarian leiomyosarcomas.

In conclusion, to our knowledge we have reported the first case of POL associated with a Brenner tumor. It indicates that a thorough immunohistochemical and morphological examination is necessary to establish the diagnosis because parts of the tumor may lose some markers and EMA positivity can not preclude the diagnosis of leiomyosarcoma.

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