

Malignant Fibrous Histiocytoma Arising in a Mature Cystic Teratoma of the Ovary – A Case Report –

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A 50-year-old female patient presented with anorexia and weight loss. Pelvic computed tomography revealed a 12.5 × 7.3 cm heterogeneous mass in the left ovary. About 30% of the tumor was occupied by a mature cystic teratoma. The remaining solid portion was composed of fibrous and histiocytic elements, arranged in storiform patterns admixed with bizarre giant cells. The mitotic index was 8 per 10 high power fields, including atypical mitoses. The only immunopositivity was for vimentin. The tumor was diagnosed as a malignant fibrous histiocytoma arising in a mature cystic teratoma. To the best of our knowledge, this is only the third such case in the English language literature.

Key Words : Histiocytoma, malignant fibrous; Teratoma; Ovary

Malignant transformation of a mature cystic teratoma is rare, with an incidence of 1-3%. Sarcomatous transformation is even more unusual; only a few cases of leiomyosarcoma, chondrosarcoma, osteosarcoma, angiosarcoma, fibrosarcoma and malignant fibrous histiocytoma have ever been described.¹ Herein, we report a case of malignant fibrous histiocytoma arising in a mature cystic teratoma. According to our review of the literature, this is only the third account of such a case.

CASE REPORT

A 50-year-old, gravida 2-0-1-2, female patient presented with anorexia and weight loss of 8 kg over a period of four months. Her menarche occurred at 17 years of age, and her menstruation cycle was regular with an interval of 30 days. Analysis of the peripheral blood revealed severe anemia with a hemoglobin level of 6.0 g/dL. Other laboratory results were within normal

limits, including alpha-fetoprotein (1.18 ng/mL), cancer antigen-125 (17.4 IU/mL), carcinoembryonic antigen (1.49 ng/mL) and beta-hCG (1.20 mIU/mL). Pelvic computed tomography revealed a 12.5 × 7.3 cm heterogeneous mass in the left ovary. Within the tumor, lobulated soft tissue densities showing diverse contrast enhancement admixed with focal low contrast fat areas were noted (Fig. 1). The patient underwent a radical hysterectomy with bilateral adnexectomy. On gross examination, the mass measured 13.0 × 9.0 × 8.0 cm and weighed 168.0 g. It was encapsulated with a pale-gray colored, smooth and glistening capsule. A cut section displayed two components in different proportions: 30% cystic and 70% solid. The former contained fat, sebaceous materials and hairs, whereas the latter was white in color and firm in consistency with focal necrosis and hemorrhage (Fig. 2). The two different components were admixed with no definite demarcation. The right ovary was grossly unremarkable. Microscopically, the cystic portion was lined by stratified squamous epithelium overlying sebaceous glands. Numerous

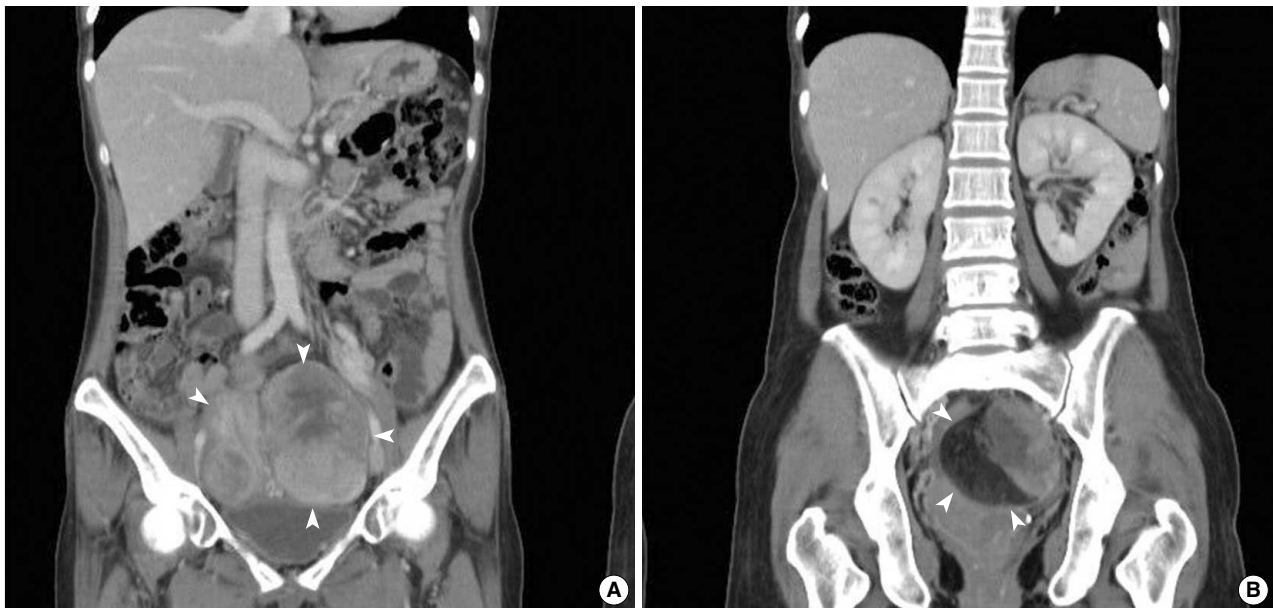


Fig. 1. Radiologic findings. (A) Pelvic computed tomography demonstrating a 12.5 × 7.3 cm heterogeneous mass (arrowheads) in the left ovary. (B) Inside the tumor, lobulated soft tissue densities showing diverse contrast enhancement are present with low contrast areas of fat densities.

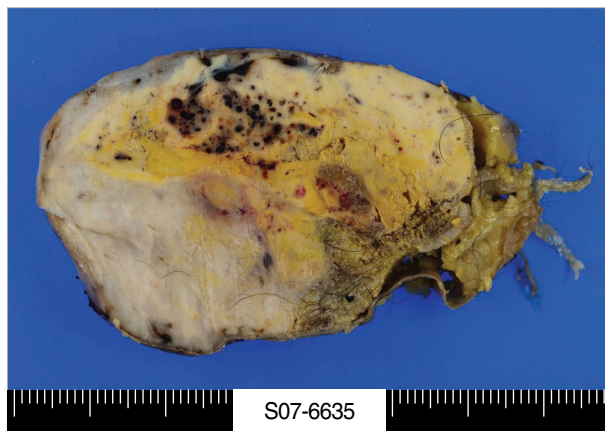


Fig. 2. Gross findings. On cut section, the mass displays a heterogeneous appearance, with areas of necrosis and hemorrhage. The cystic portion, mainly on the right, shows adipose tissue, sebaceous materials and hairs. The solid portion, mainly on the left, has a white, firm consistency. The yellow colored area is composed mainly of foamy macrophages. Note that the solid and cystic areas are admixed without separation.

hair follicles and foreign body giant cells were seen. No immature tissue was identified. These findings were consistent with a mature cystic teratoma. Adjacent to this lesion, spindle cell proliferation was present in a vague storiform pattern admixed with foamy macrophages and bizarre neoplastic giant cells, in addition to hemorrhage, necrosis and a mild chronic inflammatory cell infiltrate. The tumor cells had irregular nuclei with vesicu-

lar chromatin and prominent nucleoli, and exhibited considerable mitotic activity (8/10 high power fields) with atypical mitotic figures (Fig. 3A-E). Immunohistochemical staining was positive for vimentin only (Fig. 3F); actin, desmin, myoglobin, S-100 protein, cytokeratin, neuron specific enolase, CD34 and human melanoma black-45 all gave negative results.

Differential diagnosis included a variety of other pleomorphic sarcomas such as leiomyosarcoma, rhabdomyosarcoma, liposarcoma and malignant fibrous histiocytoma.

Leiomyosarcoma may have pleomorphic areas that resemble a malignant fibrous histiocytoma, but it is usually possible to document myogenic differentiation in the less pleomorphic areas.² Smooth muscle actin and muscle-specific actin (HHF35) can be detected in most leiomyosarcomas, and the present case stained negative for smooth muscle actin.

Pleomorphic rhabdomyosarcomas may be arranged in a storiform or fascicular pattern, but the lack of striation and rhabdoid morphology characterized by the presence of a peripherally located vesicular nucleus, prominent nucleolus and intracytoplasmic eosinophilic hyaline inclusion ruled out this possibility.³ Immunohistochemical staining for desmin, and myoglobin and MyoD1 are useful for recognizing pleomorphic rhabdomyosarcoma, but the present case was negative for desmin.

Pleomorphic liposarcoma may resemble malignant fibrous histiocytoma, but they differ in their content of intracellular lipid material.⁴ The present case was devoid of adipocytic differentia-

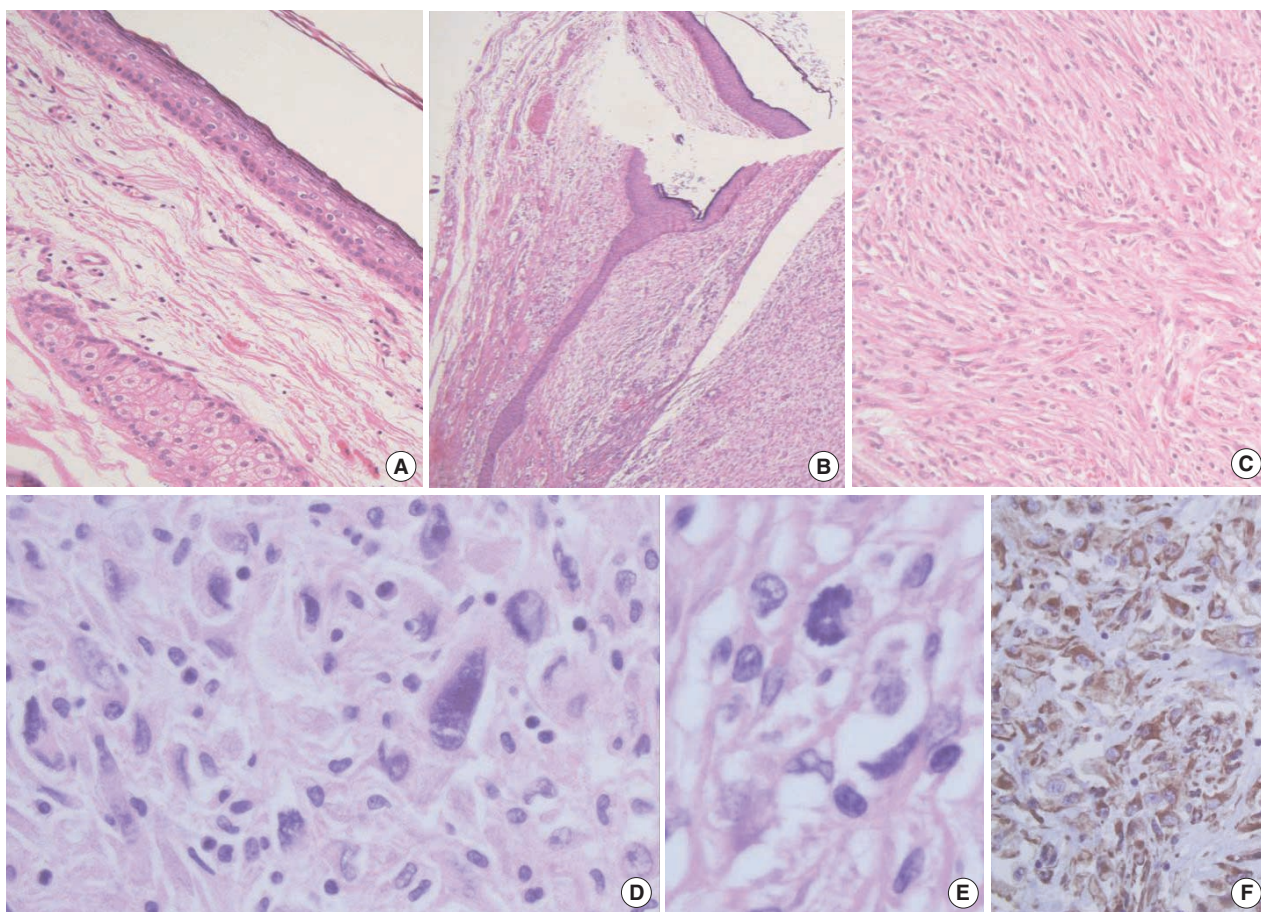


Fig. 3. Microscopic findings. (A) The cystic portion lined with stratified squamous epithelium overlying sebaceous glands, is consistent with mature cystic teratoma. (B) A transitional area of the cystic lining into the solid areas of spindle cell proliferation. (C) Storiform pattern of the spindle cells. (D) Bizarre neoplastic giant cells. (E) Atypical mitotic figure. (F) Cytoplasmic immunoreactivity for vimentin.

tion. The absence of lipoblasts with scalloped nuclei and vacuolated cytoplasm and negative staining for S-100 protein ruled out the possibility of liposarcoma.

Based on our histological and immunohistochemical findings, the tumor was diagnosed to be a malignant fibrous histiocytoma arising in a mature cystic teratoma. The patient received 6 cycles of chemotherapy and was without any signs of recurrence or metastasis during 18 months of follow-up.

DISCUSSION

Mature cystic teratomas account for 10-20% of all ovarian tumors. However, malignant transformation of mature cystic teratomas is rare, with a reported incidence of only 1-3%. Although various types of malignancy may develop from the three germ-cell layers, the most common malignancy arising from a mature cystic teratoma is squamous cell carcinoma.⁵ Sarcoma arising from

mature cystic teratoma is extremely uncommon, and only a few cases of leiomyosarcoma, chondrosarcoma, osteosarcoma, angiosarcoma, fibrosarcoma and malignant fibrous histiocytoma have ever been reported.¹

Malignant fibrous histiocytoma of the ovary itself is extremely rare with only four reported cases in the literature.⁶⁻⁹ Ueda *et al.*⁶ reported the first case of malignant fibrous histiocytoma in the ovary in 1977. The patient was 42 years old and presented with lower abdominal pain and fever. Surgical excision revealed a 30.0 × 25.0 × 20.0 cm mass. Two thirds of the mass was a mature cystic teratoma, and the remaining third was a malignant fibrous histiocytoma. Five months after surgery, metastasis occurred in the mesentery of the sigmoid colon. Hanada *et al.*⁷ described a combined squamous cell carcinoma and myxoid variant of malignant fibrous histiocytoma arising in a dermoid cyst of a 75-year-old female. Two other cases were malignant fibrous histiocytomas without any associated teratoma.^{8,9} The present case is thus the third case of malignant fibrous histiocytoma arising

in a mature cystic teratoma.

The relationship between mature cystic teratoma and its secondary malignancy is yet to be established. The rarity of sarcoma arising from mature cystic teratoma limits evaluation of the histogenesis. Using selective tissue microdissection and polymerase chain reaction-based analysis, Devouassoux-Shisheboran *et al.*¹⁰ demonstrated that the genetic profiles of teratoma components and malignant components were identical. This suggests a germ cell origin of the secondary, non-germ cell malignancy. However, it was a limited study of eight cases with non-germ cell malignancies arising in mature cystic teratomas. Furthermore, rhabdomyosarcoma and angiosarcoma were the only sarcomas represented in their study.

The prognosis of patients with secondary malignancies arising in mature cystic teratomas is poor, with most patients dying within one year.⁵ Poor prognostic factors include tumor dissemination, cyst wall invasion, ascites, spontaneous or accidental rupture, adhesions, and tumor type other than squamous cell carcinoma.¹¹ The case of combined squamous cell carcinoma and malignant fibrous histiocytoma arising in a dermoid cyst was associated with a twenty-one-month follow up period without disease recurrence.⁷ Another patient with fibrosarcoma arising in a mature cystic teratoma demonstrated no signs of recurrence after a one-year follow up.¹ Our patient had none of the poor prognostic factors mentioned above except for the tumor type at the time of surgery, and has been doing fine during 18 months of follow-up. However, our limited experience with such cases demands a close and careful follow-up.

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