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Case Report

Pathology Section

Sarcomatoid (Spindle Cell) Carcinoma Arising in Mature Cystic Teratoma as a Mural Nodule: A Case Report

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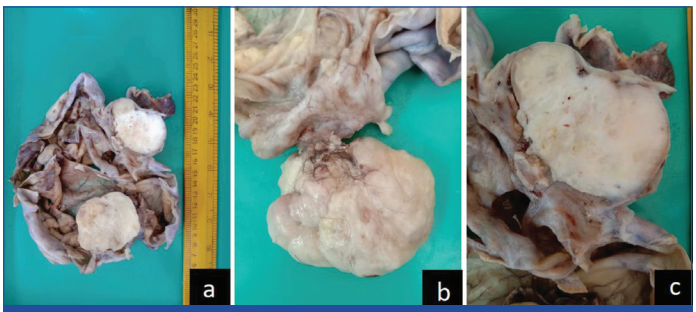
ABSTRACT

Mature cystic teratomas are the most common ovarian germ cell tumours.Malignant transformation is rare in mature cystic teratoma. Spindle cell/sarcomatoid carcinoma is an uncommon type of squamous cell carcinoma. A 45-year-old female presented with abdominal distention and discomfort. Magnetic Resonance Imaging (MRI) showed multiloculated cystic mass measuring 21×20×14 cm with heterogeneously enhancing solid component measuring 5×3.5 cm in right adnexal region. Excision of the mass done. Macroscopic examination showed irregular cystic mass containing pultaceous material and hair, and a mural nodule measuring 5×5 cm. On histopathological examination, the cyst wall showed mature teratomatous elements. Sections from mural nodule showed sheets of atypical spindle cells with increased mitosis and foci of necrosis. On immunohistochemical examination, the spindle cells showed patchy weak to moderate positivity for cytokeratin, 34 beta E12, CK5/6 and P40. Diagnosis of spindle cell/sarcomatoid carcinoma arising in mature cystic teratoma was given. Malignant transformation in mature cystic teratoma is rare and should be suspected in large sized tumours in older patients. Sarcomatoid carcinoma is an extremely rare form of secondary malignant neoplasm arising from mature cystic teratoma.

Keywords: Adnexal mass, Multiloculated cystic mass, Secondary malignant neoplasm, Squamous cell carcinoma

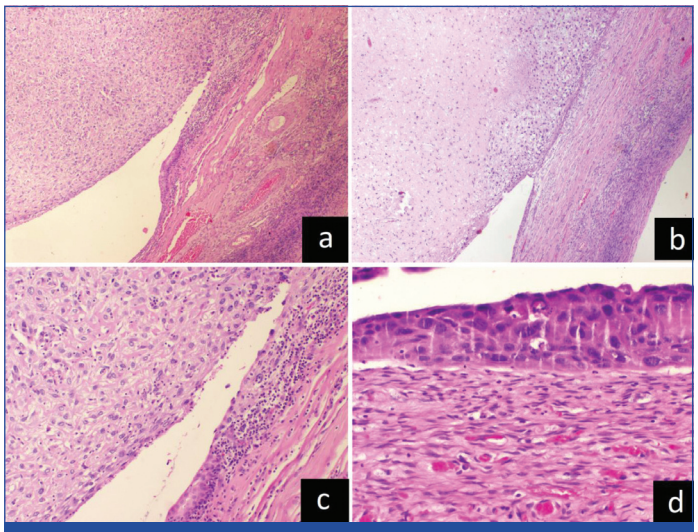
CASE REPORT

A 45-year-old female presented with complaints of abdominal distention and discomfort of three months duration. There was no significant illness in the past. Examination showed 20×20 cm firm abdominopelvic mass lesion. Routine blood investigations were within normal limits. The Cancer Antigen 125 (CA 125) level was 73 U/mL and CEA was 6.39 ng/mL. Ultrasound (USG) abdomen showed large complex cyst measuring 20×19×16 cm with solid component measuring 6×6 cm. Magnetic Resonance Imaging (MRI) showed multiloculated cystic mass 21×20×14 cm with heterogeneously enhancing solid component 5×3.5 cm in the right adnexal region. Excision of adnexal mass was planned. Peroperatively, there was a complex cystic mass measuring 30×25 cm with impending rupture in right adnexal region with minimal ascites. Excision specimen was sent for frozen section diagnosis. Macroscopic examination showed irregular cystic mass containing pultaceous material and hair. There was a mural nodule measuring 5×5 cm, cut section of which was solid grey white with glistening areas [Table/Fig-1].



[Table/Fig-1]: (a) Gross examination showing cyst with mural nodule, (b) Base of mural nodule showing hair, (c) Cut section of mural nodule firm, glistening.

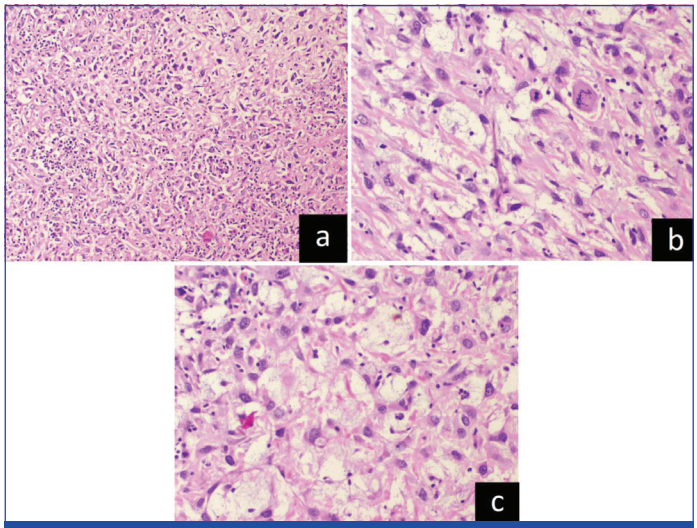
Frozen section examination of the mural nodule showed sheets of atypical spindle cells with nuclear pleomorphism and increased mitosis. Cyst wall showed lining by mature squamous epithelium and hair follicles. A diagnosis of mature cystic teratoma with mural nodule showing poorly differentiated malignant spindle cell neoplasm was given. The patient underwent type A hysterectomy, left salpingo-oophorectomy, omentectomy with bilateral pelvic and paraaortic lymph node sampling. On further histopathological examination, the cyst wall showed lining by squamous epithelium, hair follicles, sebaceous glands, adipocytes and foci of ulceration. Cyst wall adjacent to mural nodule showed foci of moderate to severe dysplasia of squamous epithelium [Table/Fig-2].



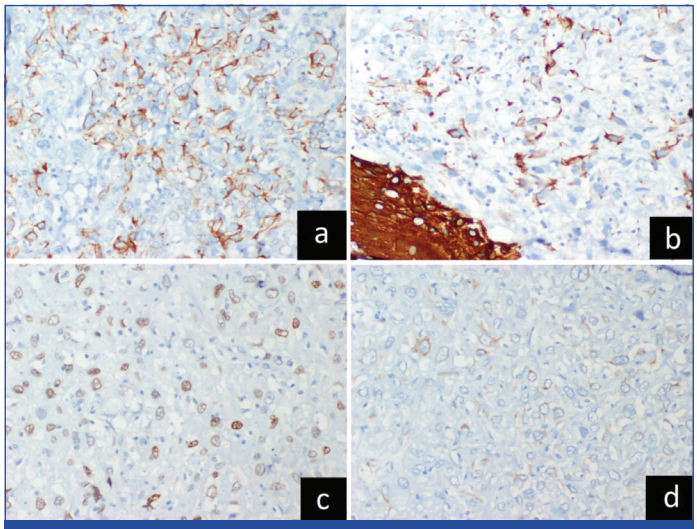
[Table/Fig-2]: (a) Microscopy showing cyst wall lined by squamous epithelium with mural nodule (H&E, 50X), (b) Microscopy showing cyst wall and mural nodule (H&E, 40X), (c) mural nodule showing sheets of ovoid/ spindly cells (H&E, 100X), (d) Dysplastic squamous epithelium adjacent to mural nodule (H&E, 200X).

Sections from mural nodule showed sheets of atypical spindly cells with moderate amount of pale eosinophilic cytoplasm, plump ovoid/spindly nuclei, variably prominent nucleoli. Mitosis including atypical forms and foci of necrosis noted [Table/Fig-3]. On immunohistochemical examination, the spindle cells showed patchy weak to moderate positivity for cytokeratin, Epithelial membrane antigen (EMA), CK5/6 and P40 [Table/Fig-4]. The cells were negative for SMA and desmin. Ascitic fluid cytology also showed malignant cells. Correlating the morphology and immunoprofile diagnosis of

sarcomatoid (spindle cell) carcinoma (stage 1C) arising in mature cystic teratoma was given. Based on the stage of the disease, chemotherapy was started.



[Table/Fig-3]: (a) Microscopy of mural nodule showing sheets of atypical cells (H&E; 100X), (b) Higher power view showing spindly and pleomorphic cells, atypical mitosis, myxoid background (H&E; 200X); (c) Ovoid/spindly cells in myxoid background (H&E; 200X).



[Table/Fig-4]: The atypical spindly cells showing patchy positivity for a) cytokeratin; b) Ck5/6; c) P40; d) 34 beta E12 (IHC; 200X).

DISCUSSION

Mature Cystic Teratoma (MCT) constitute almost 20% of all ovarian neoplasms [1-3]. Mature teratoma is a tumour composed exclusively of mature tissues derived from two or three germ layers. Ectodermal derivatives include squamous epithelium and cutaneous adnexal structures (sebaceous and sweat glands, hair follicles) as well as neural ectoderm. Mesodermal derivatives are represented by fat, muscle, bone, cartilageand teeth. Endodermal derivatives consist of the respiratory/gastrointestinal epithelium, thyroid and salivary gland [1-3].

Although mature cystic teratoma is benign, malignant transformation can occur in 1% to 2% of cases [1,2]. A malignant tumour can arise from any of three germ cell layers in a teratoma and is identified adjacent to both normal and metaplastic cells. Squamous Cell Carcinoma (SCC) is the most common somatic malignancy arising in a teratoma, followed by adenocarcinoma, melanoma and sarcoma [1-3]. Squamous cell carcinoma variants including verrucous, papillary, spindle cell/sarcomatoid, basaloid and adenosquamous carcinomas are also been rarely described in malignant transformation of mature teratoma [1,4].

Spindle cell/sarcomatoid carcinoma is an uncommon type of squamous cell carcinoma, comprising up to 3% of all cases of SCC [4,5]. Spindle cell/sarcomatoid carcinoma show divergent differentiation by epithelial-mesenchymal transition. The usual presentation of spindle-cell /sarcomatoid squamous cell carcinoma is as an exophytic mass with a predominantly ulcerated surface. The diagnosis of spindle cell carcinoma is based on demonstrating epithelial differentiation, either on routine morphology (squamous dysplasia of residual surface epithelium or foci of conventional squamous cell carcinoma mixed with sarcomatoid tumour) or by positive immunostaining {cytokeratins, Epithelial membrane antigen (EMA), p63, or p40}. However, around one third of spindle cell carcinomas are purely spindled and will not demonstrate any epithelial component. Heterologous mesenchymal differentiation in the form of malignant bone, cartilage, or skeletal muscle can also occur [6-8]. The expression of epithelial markers by the spindle cells is variable. Only 70% of cases will show positive immunostaining for epithelial markers [1,2]. In addition, focal expression of mesenchymal markers including smooth muscle actin, muscle-specific actin and S100 protein can be present adding to diagnostic dilemma.

When this malignant spindle cell neoplasm is not demonstrating epithelial component on routine histopathological examination and not expressing epithelial markers by immunohistochemistry, the diagnosis become most challenging. The differential diagnoses include leiomyosarcoma, rhabdomyosarcoma, angiosarcoma, fibrosarcoma and malignant fibrous histiocytoma [2,3,7]. Thorough sampling to identify epithelial component and immunohistochemical study using multiple epithelial markers will help in rendering an accurate diagnosis.

Two hypotheses have been proposed for the histogenesis of SCC in mature teratoma of the ovary. According to the first, it arises from the squamous epithelium of the teratoma. According to the second hypothesis, SCC arises from columnar epithelium which has undergone squamous metaplasia [3,9,10].

In their study, Amérigo J et al., demonstrated carcinoma in situ of a bowenoid type in two out of five SCCs arising from mature cystic teratoma cases and they suggested that the SCC was of epidermal origin [9]. Iwasa A et al., studied the expression of CK10 and CK18 in 24 cases of SCCs arising from teratomas. They found the majority of the cases (14/21 cases) expressed CK18 which is normally expressed in the columnar epithelium. Only a minority of cases (7/21 cases) showed CK10 positivity which is normally expressed in the squamous epithelium. These findings are very similar to the SCCs of cervix and lung, derived from squamous metaplasia derived from columnar epithelium [10].

Because of rarity of this condition, the optimal management remains unclear. Surgery is the mainstay treatment. Surgical management include total abdominal hysterectomy, bilateral salpingo-oophorectomy, omentectomy and surgical debulking of all grossly visible disease. The role of adjuvant therapy is unclear. Adjuvant chemothearapy is offered in high-stage disease.

CONCLUSION(S)

The most common malignant transformation in teratoma is squamous cell carcinoma. In most cases, SCC is moderately differentiated and is exclusively associated with mature teratomas/dermoid cysts. Large teratomas in older patients should be carefully sampled for malignant component. Sarcomatoid carcinoma is an extremely rare form of secondary malignant neoplasm arising from mature teratoma and present as mural nodule.

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