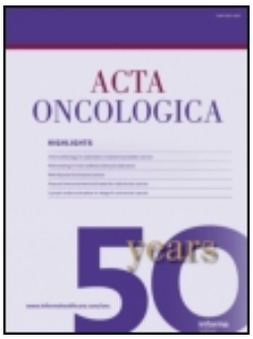

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Primary Malignant Melanoma Arising in an Ovarian Cystic Teratoma

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Primary malignant melanoma of the ovary is very rare (1–5). It originates mostly in a cystic teratoma and is one of the rarest forms of malignant transformation in cystic teratoma (3, 6). However, before stating that it is a primary ovarian neoplasm, the possibility of metastasis from a primary cutaneous or malignant melanoma elsewhere must be excluded (7, 8).

We describe a case of primary malignant ovarian melanoma originating in a mature cystic teratoma.

Material and Methods. The surgical material was fixed in 10% buffered formalin and embedded in paraffin. Histological sections were stained with hematoxylin and eosin. A immunohistochemical study was performed using mono and polyclonal primary antibodies: monoclonal vimentin (clone V9, Biogenex), polyclonal S100 (DAKO), monoclonal anti-melanoma (clone HMB-45, Biogenex), monoclonal AE1/AE3 (AE1/AE3 clone, Ylem). An avidin-biotin-peroxidase technique, using DAB (diaminobenzidin) as the chromogen, was employed for visualizing.

Case report. The patient was a 74-year-old woman with diffuse abdominal pain, modest abdominal distension, reduced intestinal peristalsis and a feeling of heaviness in the pelvis. A direct abdominal radiologic examination did not reveal any distension of the intestinal loop, but some air fluid levels in the left quadrants were detected. An explorative laparatomy revealed a left ovarian neoformation with stretching in the homolateral uterine tube. The right ovary was atrophic, as was the uterus. Cytology of the peritoneal fluid was negative. Bilateral salpingo-oophorectomy was performed.

The patient is alive and well seven months after surgery.

The tumor was prevalently grossly cystic, measuring $14.6 \times 11 \times 9.5$ cm and adhering to the homolateral uterine tube. Incision revealed cystic areas containing sebaceous-like material and hairs and solid reddish-brown nodular areas (Fig. 1).

Microscopic examination revealed that the cystic areas were partially covered by epidermis-like keratinizing squamous epithelium or by pseudostratified cylindrical epithelium with hair follicles and sebaceous glands, beneath which adipose, smooth muscle and mixoid connective tissues could be seen. The nodules were composed of epithelioid cells with vesicular nuclei, prominent nucleoli and eosinophilic cytoplasm, sometimes containing blackish-brown pigment (Fig. 2). These cells had an alveolar or sheet pattern and were mixed with histiocytes containing melanine. In some sections these cells tended to infiltrate and destroy the covering epithelium, sometimes replaced by necrotic-hemorrhagic material. Focally, melanomatous cells, forming nests in the lining epithelium and

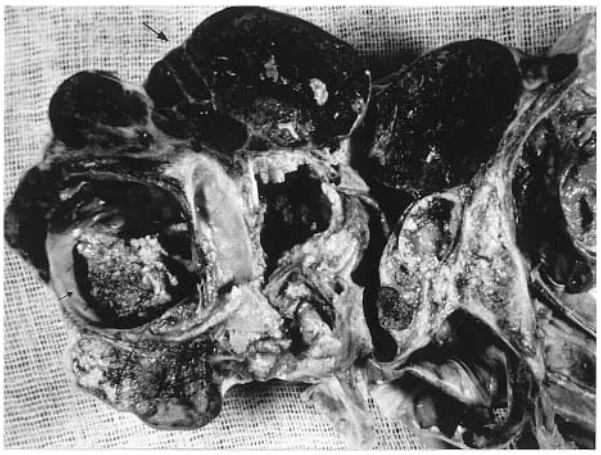

Fig. 1. Gross appearance of the cystic tumor of left ovary. Cystic areas containing sebaceous-like material and hairs (short arrow) and solid reddish-brown nodular areas (long arrow).

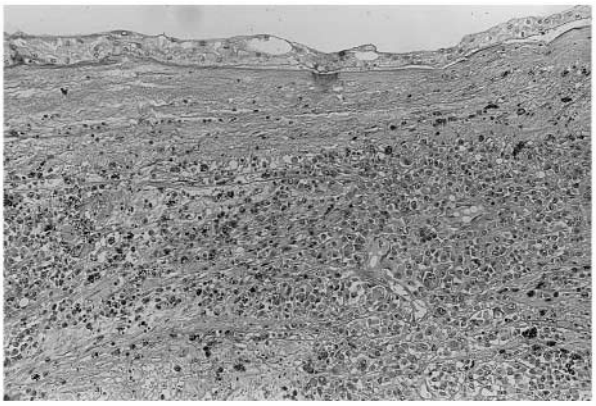

Fig. 2. The cyst wall lined by squamous epithelium and malignant melanoma below (H&E, $\times 100$).

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Table 1

Primary malignant melanoma arising in a cystic teratoma of the ovary

Reference	Year	Age	Symptoms	Duration	Macroscopic findings	D.E.J. activity	Benign pigmented lesion	Follow-up
Amann*	1903	59	Abdominal swelling	6 months	Child's head size dark blue tumor, small dermoid cyst	−	−	Died 1 year 6 months, liver, bone, lymph node metastases
Lorrain*	1905	50	Abdominal swelling sudden right lower abdominal pain	4 days	Fetal head size, ruptured dermoid cyst	−	−	Died 1 day after the operation
Marcial-Rojas & Ramirez de Arellano (14)	1956	77	Mass in the lower abdomen	8 months	Right 10 cm cyst, 4 cm greyish sessile	+	−	No follow-up
Bruning (11)	1963	50	Abdominal swelling, pain, vaginal spotting	2 weeks	Left 11 cm cyst, small pigmented spot	−	−	Died 2 months. Peritoneal implants
Park et al. (17)	1970	49	Fibroids	15 years	Right $8\times8\times8$ cm cyst, $3\times1.5\times1.5$ cm dark red nodule	+	−	NED 1 month
Leo et al. (2)	1973	72	Lower abdominal pain	3 days	Right 11 cm cyst, $2\times2\times1$ cm greyish black mass	+	−	NED 8 month
Tham et al. (19)	1981	44	Dysuria, dysmenorrhea	2 months	Right $8\times8\times3$ cm cyst, pigmented areas	−	−	Died 8.5 months, abdominal wall, peritoneum, liver lung metastases
Cronje & Woodruff (12)	1981	74	Abdominal distension		Dermoid cyst, solid mass (size not mentioned)	+	−	Died 1 year 6 months, bone metastasis
Gregg (1)	1982	56	Abdominal distension	6 months	Left $18\times15\times10$ cm cyst, 3 cm multiple nodules	−	−	Died 4–5 months, liver, spleen metastases (clinical)
Parekh (16)	1985	26	Lower abdominal pain	5 days	10.5×8.5 cm cyst, dark brown irregular areas	+	−	Died 8 months
Tsukamoto et al. (4)	1986	46	Abdominal distension	4 months	Left $22.5\times14.4\times11.5$ cm cyst, $6\times5\times6$ cm black tumor	−	−	NED 1 year
Boughton et al. (10)	1987	27	None: (detected during pregnancy)		Right 8 cm cyst, 1.5×1 cm brown plaque	+	−	NED 2 year
Nanbu et al. (6)	1990	47	Lower abdominal distension	2 months	Left $8\times7.7\times6.2$ cm amelanotic mass	+	−	NED 18 months
Takubo et al. (3)	1991	65	Abdominal distension	1 month	Right 12 cm dermoid cyst, 2 cm melanotic mass	+	+	NED 24 months
Ueda et al. (5)	1991	86	Abdominal swelling, pain, dysuria, vomiting	3 months	Right $14\times9\times9$ cm cyst, 3.2 cm greyish nodular tumor	−	+	Died on the first admission day
Selak et al. (18)	1991	66			Cystic mass in the left ovary	+		
Borup et al. (9)	1992	66	Abdominal distension, pain, mild fever	3 months	Left 18×20 cm cyst dermoid	−	−	Died within 12 months
Carlson & Wheeler (7)	1993	20	Acute abdominal pain		Right 21 cm dermoid cyst, hemorrhagic nodules	−	−	NED 60 months
Di Vagno et al. (13)	1993	62	Uterine prolapse, lower abdominal swelling, urinary stress incontinence	6 months	Right $10\times8.5\times9$ cm dermoid cyst, $4.5\times4\times3$ cm solid amelanotic mass	−	−	Alive 12 months
Otero et al. (15)	1995		None: (during a cesarean section)		Cystic mass in the left ovary			
Our case	1998	74	Abdominal distension, pain		Left $14.6\times11\times9.5$ cm dermoid cyst containing solid reddish brown nodular areas	+	−	NED 7 months

* Cited by Ueda et al. (5)
DEJ = dermoepidermal junction; NED = no evidence of disease.

resembling a spreading, superficial melanoma, were seen (Fig. 3). Occasionally in the lining epithelium overlying or adjacent to the tumor, there was proliferation of atypical cells, some containing melanin pigment, similar to that seen in junctional nevi of the skin (junctional activity) (Fig. 4). Immunohistochemically, the neoplastic cells were positive for vimentin, S-100 and anti-melanoma.

Discussion. Primary malignant ovarian melanoma is very rare. To date in world literature, there are only 20 cases originating in a cystic teratoma (1–7, 9–19) (see Table 1). Less rare are ovarian metastases originating from skin, mucous membrane or choroid malignant melanoma. Autopsy series of patients with extraovarian melanoma reveal ovarian metastases in 18% of cases (7, 8, 20).

Malignant transformation of mature cystic teratoma is uncommon and is found in less than 2% of cases (3, 7, 9, 12, 21). Usually

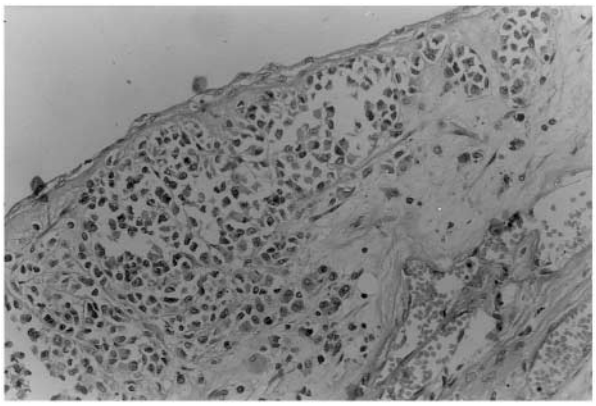

Fig. 3. Stratified squamous epithelium of the dermoid cyst with junctional activity of melanocytes (H&E, × 250).

it is monolateral and mostly found in post-menopausal women, median age 53 years (5, 8).

All the tissues in a teratoma can undergo malignant change, above all squamous epithelium transforming into squamous carcinoma (2, 3, 21). Melanocytes of skin, meninges, and ocular epithelium present in the teratoma can also give rise to a melanoma. Malignant melanoma is one of the rarest forms of this type of malignant transformation (3).

The extreme rareness of primary ovarian melanoma and the greater frequency of ovarian metastases from melanomas originating in other sites demand rigid criteria for a malignant melanoma located in the ovary to be defined as primary (12). These are: 1) exclusion of an extraovarian site of origin of the neoplasm; 2) unilateral involvement in the ovarian teratoma; 3) symptoms and age of patient in agreement with well-documented cases in the literature; 4) demonstration of melanocytic junctional activity.

To the best of our knowledge, in the English literature there were only 14 cases of primary malignant ovarian melanoma complying with the above requisites until 1993 (7). We believe that this case can be added to the number. A scrupulous examination of the patient showed no clinical evidence of primary extraovarian melanoma, but the symptoms and age of the patient in agreement with published cases, the monolaterality of the lesion in a mature cystic teratoma, the intraepidermal junctional activity of melanocytes, all support our interpretation of this case.

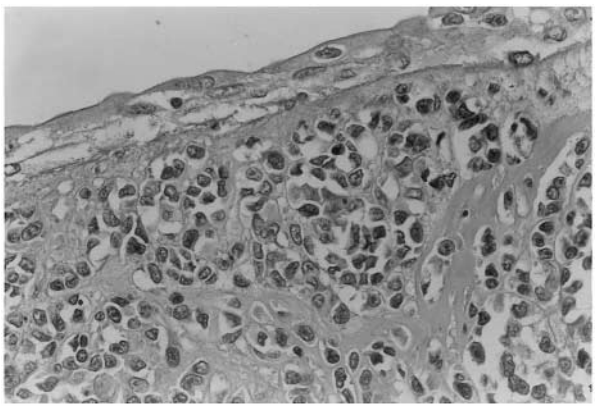

Fig. 4. The squamous epithelium overlying the melanoma reveals melanin-containing atypical cells, 'junctional activity' (H&E, × 400).

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