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Abstract

A case of ovarian leiomyoma is reported, together with histologic, immunohistologic and electron microscopic findings. A solid firm tumor, measuring 6.5 X 5 X 5 cm, was found in the right ovary of a 65-year-old woman. The tumor had an obvious whorled pattern on the cut-surface. Well-differentiated, long spindle-shaped neoplastic cells revealed positive immunoreactivity for anti-desmin. Ultrastructural observations included numerous microfilaments with dense patches in the cytoplasm, micropinocytotic vesicles beneath plasma membranes and continuous basal laminae around neoplastic cells. These findings were compatible with leiomyoma. The possible histogenesis of ovarian leiomyoma was discussed.

KEYWORDS: leiomyoma, ovary, immunohistochemistry, ultrastructure

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A Case of Ovarian Leiomyoma

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A case of ovarian leiomyoma is reported, together with histologic, immunohistologic and electron microscopic findings. A solid firm tumor, measuring $6.5 \times 5 \times 5$ cm, was found in the right ovary of a 65-year-old woman. The tumor had an obvious whorled pattern on the cut-surface. Well-differentiated, long spindle-shaped neoplastic cells revealed positive immunoreactivity for anti-desmin. Ultrastructural observations included numerous microfilaments with dense patches in the cytoplasm, micropinocytotic vesicles beneath plasma membranes and continuous basal laminae around neoplastic cells. These findings were compatible with leiomyoma. The possible histogenesis of ovarian leiomyoma was discussed.

Key words : leiomyoma, ovary, immunohistochemistry, ultrastructure

Leiomyoma tends to arise in the uterus and supporting tissues of the female reproductive organs, although primary ovarian origin of leiomyoma has been reported (2,3,9). We report herein a typical case of ovarian leiomyoma, together with immunohistologic and electron microscopic observations.

A 65-year-old woman (gravida 2, para 1) was admitted to the Kochi Medical School Hospital for a lower abdominal mass, which had been pointed out on mass screening for uterine cancer. Laboratory data on admission were almost normal except for mild anemia; RBC $372 \times 10^4/\text{mm}^3$ and Hb 12.4 g/dl. Squamous-cell-carcinoma antigen (0.69 ng/ml) and carbohydrate antigen-125 (9.73 u/ml) were also normal. Ultrasono-

graphy of the abdomen revealed a solid mass, measuring 6.5×4.8 cm in the right ovary. Total hysterectomy and bilateral adnexectomy including the right ovarian mass was performed on December 4, 1987.

Macroscopically, the right ovarian mass, measuring $6.5 \times 5 \times 5$ cm, was solid and firm. The cut surface showed an obvious whorled pattern (Fig. 1-a), disclosing a distinct border from the original ovarian cortex. Nothing particular was noted in the uterus, tube or left ovary. Histologically, long spindle-shaped tumor cells proliferated in an interlacing fascicular pattern (Fig. 1-b), accompanied by fibrosis in varying degrees. Cellular atypism and pleomorphism were absent or minor with no mitosis. Phosphotungstic acid-hematoxylin (PTAH) or Azan stain demonstrated blue- or red-stained

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intracytoplasmic myofibrils, but oil-red O stain for lipids was completely negative. Immunohistochemically, anti-desmin, -vimentin, -myoglobin and -S-100 protein antibodies (all from DAKO, Denmark) were tested on de-waxed sections of the tumor tissue by the ABC method (Immunostaining Kit, BioGenex, USA). Cytoplasm was positive for anti-desmin (Fig. 1-c) and -vimentin antibodies, but negative for anti-myoglobin and -S-100 protein antibodies. Buffered formalin-fixed tissue was further fixed in 3% glutaraldehyde and 1% osmium tetroxide, dehydrated and embedded in epoxy resin. Ultrathin sections stained with uranyl acetate and lead citrate were observed. Euchromatin-rich nuclei had a smooth surface, and cytoplasm contained abundant filamentous components. These filaments associated with characteristic dense patches were occasionally observed in the periphery of the cytoplasm (Fig. 2-a).

Clustered micropinocytotic vesicles along the plasma membrane and a continuous basal lamina were found in parts of the tumor (Fig. 2-b). Judging from the light microscopic, immunohistochemical and ultrastructural findings, the present case was compatible with leiomyoma.

Less than one percent of benign ovarian neoplasms are ovarian leiomyomas. More than 40 cases of primary ovarian leiomyoma had been found in the world literature (5, 8-11). According to these reports, the patients, ranging from 20 to 103 years of age, were predominantly menopausal and post-menopausal with no history of pregnancy. Although acute severe abdominal pain due to torsion and ascites as the initial symptoms have been reported, the patients are usually asymptomatic. Therefore, ovarian leiomyoma is found incidentally upon laparotomy or autopsy, though the tumor must be differenti-

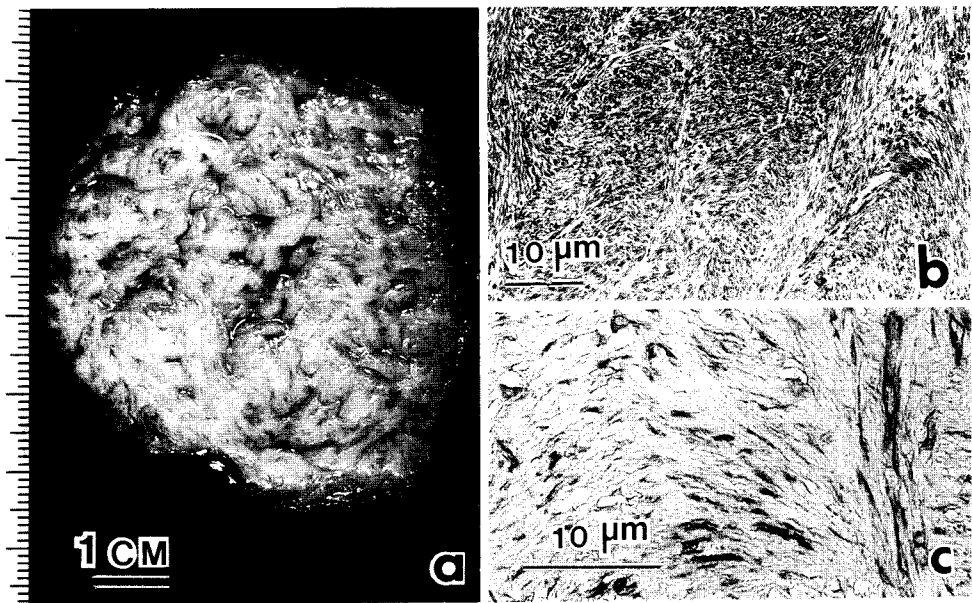


Fig. 1 Macroscopic view of the tumor showing the characteristic whorled pattern (a), histological findings revealing an interlacing fascicular pattern of tumor cells (b) (HE, $\times 100$), and immunohistochemistry showing positive anti-desmin antibody (c) (ABC method, $\times 200$).

ated from pedunculated uterine leiomyoma attached to the ovary, or leiomyoma of the broad ligament involving the hilus (3,11). In our case, there was no mass detected except for the right ovarian tumor.

Macroscopically, ovarian leiomyoma is a firm, round- or oval-shaped mass with a distinct border. It measures up to 10 cm in diameter except for a few cases (5,10). The cut-surface is solid and whitish-gray with a characteristic whorled pattern. Hemorrhage, necrosis, microcystic foci and calcification may be present. Bilateral occurrence in the ovary has been reported (5). Microscopic findings of the tumor are the same as those of other organs including the uterus and gastrointestinal tract. The diagnosis can be verified by demonstrating the smooth muscle nature of the tumor cells through histopathological, immunohistochemical and electron microscopic findings. As to the

present case, PTAH staining demonstrated myofibrils, the immune reaction was positive for desmin, and the electron microscopic examination revealed dense patches. Namely, all of them confirmed the smooth muscle nature of the tumor cells (4,7).

Although histogenesis of the primary ovarian leiomyoma is still controversial, the leiomyoma is considered to arise from smooth-muscle cells or primitive cells having the ability to differentiate to muscle cells present in vascular walls or in the ovarian ligament. These cells, however, are also present in the cortical stroma, corpus luteum, in addition to various lesions including endometriosis, endometrial cysts, mucinous cystadenoma, fibroma and Brenner tumor (3,6,9). Therefore, other possibilities do exist. In our case, the mass was detected only in the right ovary, which was not associated with the above-mentioned diseases, although the

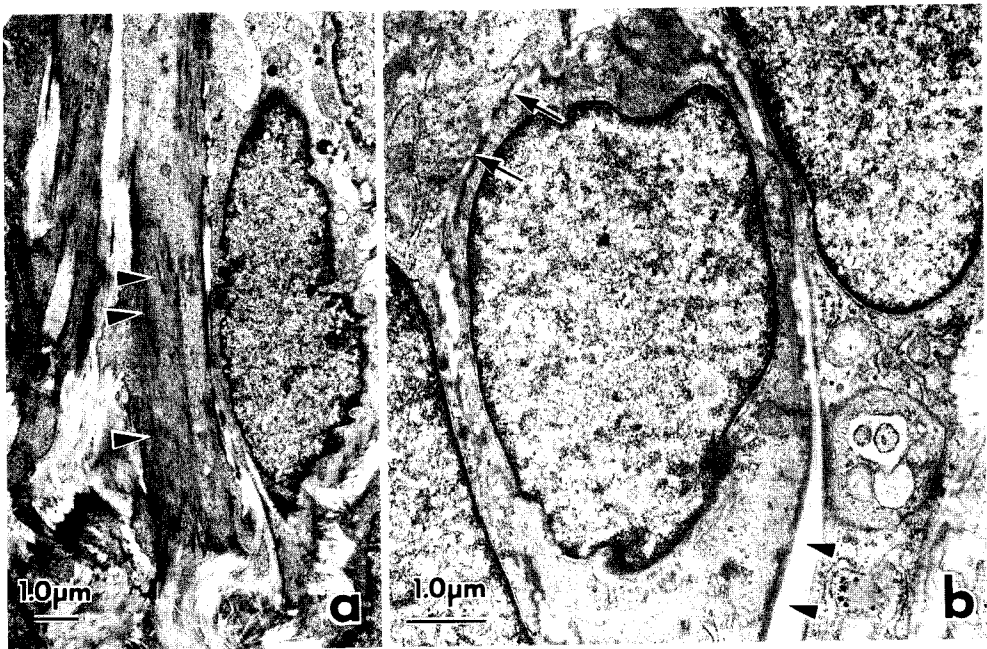


Fig. 2 Electron micrographs of the tumor. a: Longitudinally running microfilaments with dense patches (arrowheads) in the cytoplasm. $\times 6,000$. b: Micropinocytotic vesicles (arrows) and basal laminae along the plasma membrane (arrowheads). $\times 10,000$.

tumor was too large to decide precisely the site of origin, such as the hilus, vascular wall or ovarian ligament.

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