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Imaging findings of ovarian leiomyosarcoma with histopathologic correlations

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ABSTRACT

Leiomyosarcoma (LMS) is a malignant mesenchymal tumor deriving from smooth muscle. Ovarian LMS is exceedingly rare and only few reports have been reported in literature. The article illustrates a case of ovarian leiomyosarcoma in a 61-year-old woman, describing CT and MRI features correlated to histopathologic findings. LMS should be included in the differential diagnosis of solid and multiloculated ovarian lesions, in particular in post-menopausal women.

Dear Editors,

Leiomyosarcoma (LMS) is a malignant mesenchymal tumor deriving from smooth muscle. Vascular origin represents only the 2% [1], most of which arising from Vena Cava. Ovarian LMS is exceedingly rare and only few reports have been reported in English language literature [2,3]. To the best of our knowledge, the article illustrates for the first time both CT and MRI features of this lesion correlated to histopathologic findings.

A 61-year-old woman presented to Emergency Department with right colic hypochondrial pain. The patient had a history of hypothyroidism and gestosis. Electrocardiogram (ECG), count blood cells (CBC), CEA, CA15-3, CA125, CA19-9 were normal. High values of CA72-4 (42U/ml, normal range 0–6,9 U/ml) and C-reactive protein (CRP) (6,7 mg/dl, normal range 0-0,5 mg/dl) were detected. Contrast-enhanced Computed Tomography (CE-CT) was required with suspicion of right renal colic or pyelonephritis. The examination showed a right pelvic multilobulated mass with heterogeneous enhancement, correlated with colliquative intralesional areas and peripheral solid components. The lesion had no cleavage with the anterosuperior wall of the uterus and right tuba, while the homolateral ovary was not detected (Fig. 1A). Coronal images with maximum intensity projection (MIP) reconstruction revealed the continuity of the mass with the right gonadal vein, regularly draining in the Inferior Vena Cava (Fig. 1B). Moreover, there were few small right external iliac lymphnodes. Left ovary was normal, while ascites and hydronephrosis were not present. On Magnetic Resonance Imaging (MRI) the mass appeared isointense to muscle on T1-weighted images and heterogeneously hyperintense on T2-weighted images (Fig. 1C), surrounded by a subtle perilesional fluid. Diffusion weighted images (b = 800 s/mm2) and apparent diffusion coefficient (ADC) map revealed restriction of the diffusion with minimum ADC value of 0.81×10^{-3} mm^2/s and mean ADC value of $1.24\ 10^{-3}\ mm^2/s$. Open laparoscopy with removal of both ovaries and salpinges and lysis of the peritoneal-ovarian adhesions was performed. The mass weighed 190 g and measured $90 \times 60 \times 45$ mm. Macroscopic examination of the resected specimen showed an irregular, not well-defined mass of white-yellowish color and increased consistency. Microscopic section showed (Fig. 1D) spindle and pleomorphic tumor cells with eosinophilic cytoplasm often forming interlacing but disorganized fascicles. The mitotic index was 10 mitoses/10 high power fields (HPF). Areas of tumor cell necrosis and hemorrhage were present. By immunohistochemistry, the tumor cells were positive for alpha smooth muscle actin (clone 1A4, 1/100, Cell Marque) (Fig. 1E)

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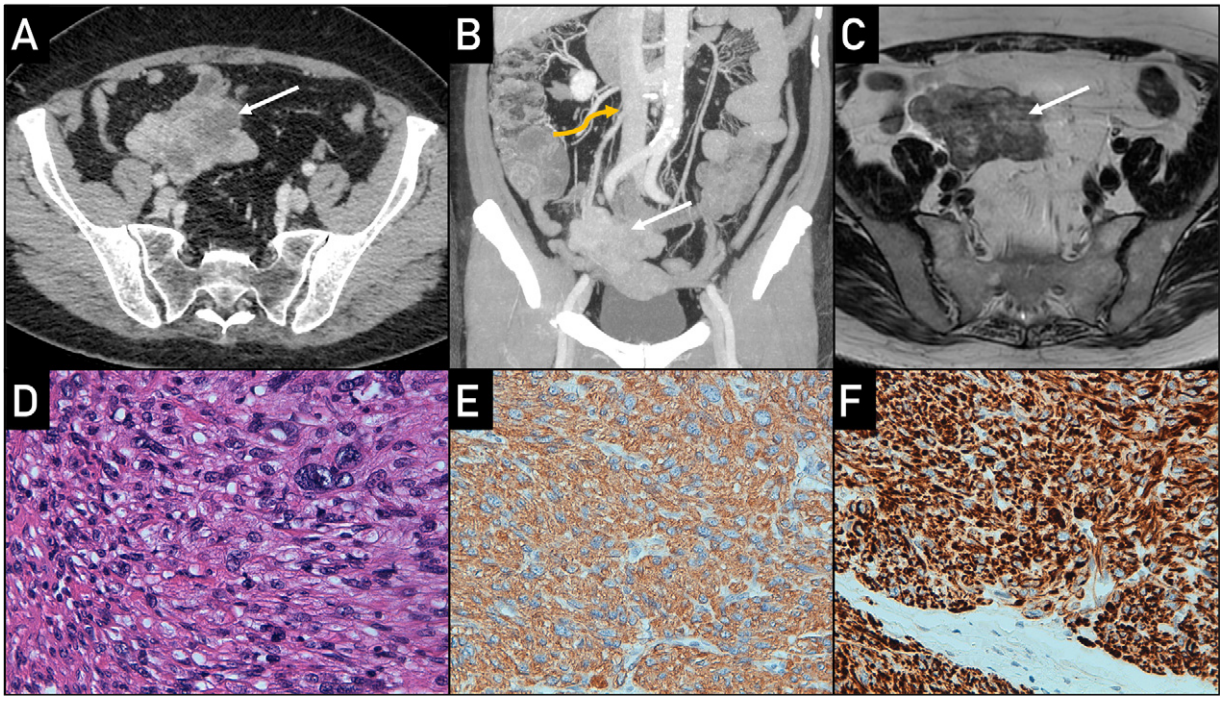

Fig. 1. Axial contrast-enhanced Computed Tomography (CE-CT). A multiloculated mass (arrow) with heterogenous contrast enhancement and low attenuated areas, is located in right iliac fossa (A); coronal CE-CT with MIP reconstruction demonstrates the vascular origin of the lesion (arrow), connected to the right gonadal vein (orange arrow) (B). Magnetic Resonance Imaging (MRI), axial plane. The lesion appears heterogenous with areas of mild hyperintensity on T2 weighted sequences (white arrow) (C). Histological images of primary ovarian leiomyosarcoma show oval to spindle cells with mild to moderate pleomorphism. Other areas of the tumor show more conspicuous atypia (Hematoxylin-eosin staining magnification 20x) (D); Immunohistochemical SMA slide shows diffuse and intense positive spindle cells (SMA, magnification 40x) (E); Immunohistochemical WT1 slide shows diffuse and intense dot-like positive in spindle cells (WT1, magnification 40x) (F).

and desmin (clone DE-R-11, 1/100, Ventana). The tumor cells had a dot-like positivity for WT1 (Clone 6F-H2, 1:100, Cell Marque) (Fig. 1F). They were negative for alpha Inhibin (clone R1, 1/100, Cell Marque) Calretinin (clone SP65, 1/100, Ventana), CD10 (clone SP67, 1/100, Ventana) Epithelial Membrane Antigen (EMA) (clone E29, 1/100, Ventana), CD31 (clone JC70, 1/100, Cell Marque), cytokeratin 7 (clone SP52, 1/100, Ventana), cytokeratin 20 (clone SP33, 1/100, Ventana). Ki-67 (clone 30-9, 1/100, Ventana) immunostaining showed nuclear labeling in 15% of the cells. Features were consistent with diagnosis of leiomyosarcoma of the ovary.

LMS is a very rare malignant tumor arising and growing along the wall vessel. Prognosis is poor for the high risk of hematogenous metastasis. Surgical resection is the primary treatment while the role of adjuvant chemo and/or radiotherapy is controversial [3].

In conclusion, LMS should be included in the differential diagnosis of solid and multiloculated ovarian lesions, in particular in post-menopausal women [4,5]. Coronal images may be useful to assess vascular origin of the lesion, allowing the radiologist to follow the vein in its complete course.

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All authors participated and contributed to data collecting, literature review and editing the report.

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Details of ethics approval

The patient was fully informed that data of the case would be submitted for publication and gave his written consent.

Conflict of interest statement

The authors have no conflict of interest to disclose regarding this manuscript.

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