Am J Transl Res 2023;15(5):3647-3652
www.ajtr.org /ISSN:1943-8141/AJTR0148281

Case Report

A rare case of hypofractionated endometrial mesenchymal sarcoma with intraventricular growth

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Received December 6, 2022; Accepted April 23, 2023; Epub May 15, 2023; Published May 30, 2023

Abstract: A 44-year-old woman with irregular vaginal bleeding for more than 10 days and a palpable mass in the lower abdomen was the subject of study. Ultrasound suggested a hypoechoic uterine mass, which was considered to be a myoma with mixed echogenicity in the uterine cavity. Scraping showed no abnormal findings. Imaging raised the possibility of tumors of adnexal origin invading the ureter. The patient then underwent an open hysterectomy, bilateral adnexal resection, pelvic lesion resection, and vascular lesion resection. Paraffin section and tissue immunology confirmed a diagnosis of low-grade endometrial mesenchymal sarcoma with vascular cancer thrombosis in the uterus. Tumor tissue was found in the right adnexa, right parametrial lesion, right internal iliac, and inferior vena cava nodes. Postoperatively, the patient received anticoagulation for venous thrombosis of the lower extremities, followed by chemotherapy. Currently, two years later, the patient is in good health and the tumor has not recurred. This metastatic ESS extended from the iliac and ovarian veins to the inferior vena cava, invading the vessels. It is particularly important to remove the lesion as completely as possible in patients with ESS involving the vessels. Furthermore, a close long-term follow-up evaluation is also essential due to the high recurrence rate of ESS.

Keywords: Endometrial mesenchymal sarcoma, intraventricular smooth disease, surgery

Introduction

Endometrial mesenchymal sarcoma (ESS) is a rare endometrial mesenchymal tumor (EST) with low malignancy and diverse histopathological, immunohistochemical, and molecular features. Its pathogenesis is unclear, but its development has been linked to obesity, long-term history of tamoxifen or estrogen use, pelvic radiation therapy, diabetes mellitus, and a young age at menarche [1, 2]. Patients with LG-ESSs often present with atypical clinical symptoms, with approximately one-quarter of patients having no obvious clinical symptoms. Common presentation symptoms include abnormal vaginal bleeding, pelvic pain, a pelvic mound, and abnormal masses. Some patients may have symptoms of extrauterine metastases (most commonly ovarian and pulmonary) as their first presentation [3]. In rare cases, low-grade endometrial mesenchymal sarcoma has been reported to invade the vasculature and grow into the veins, sometimes extending into the cardiac cavity along the pelvic static and inferior vena cava. This can lead to chest tightness, breathlessness, and progressive dyspnea, which can be difficult to distinguish from the symptoms of intraventricular smooth muscle sarcoma, which are more difficult to distinguish [4]. Here we present a rare case study of the treatment and prognosis of endometrial mesenchymal sarcoma growing into the veins and masquerading as intraventricular smooth muscle sarcoma disease.

Case presentation

The diagnosis and treatment process is briefly summarized in **Figure 1**. The patient was a 44-year-old Han Chinese woman (G2P2) who had regular menstruation in the past with 5 days and a 28-30-day cycle without dysmenorrhea. In the past four months, she had no menstrual flow, and a mass could be palpated in the abdomen with no accompanying symptoms. Ten days ago, she had vaginal bleeding without any obvious cause, which was twice the amount of her regular menstruation and lasted for 4

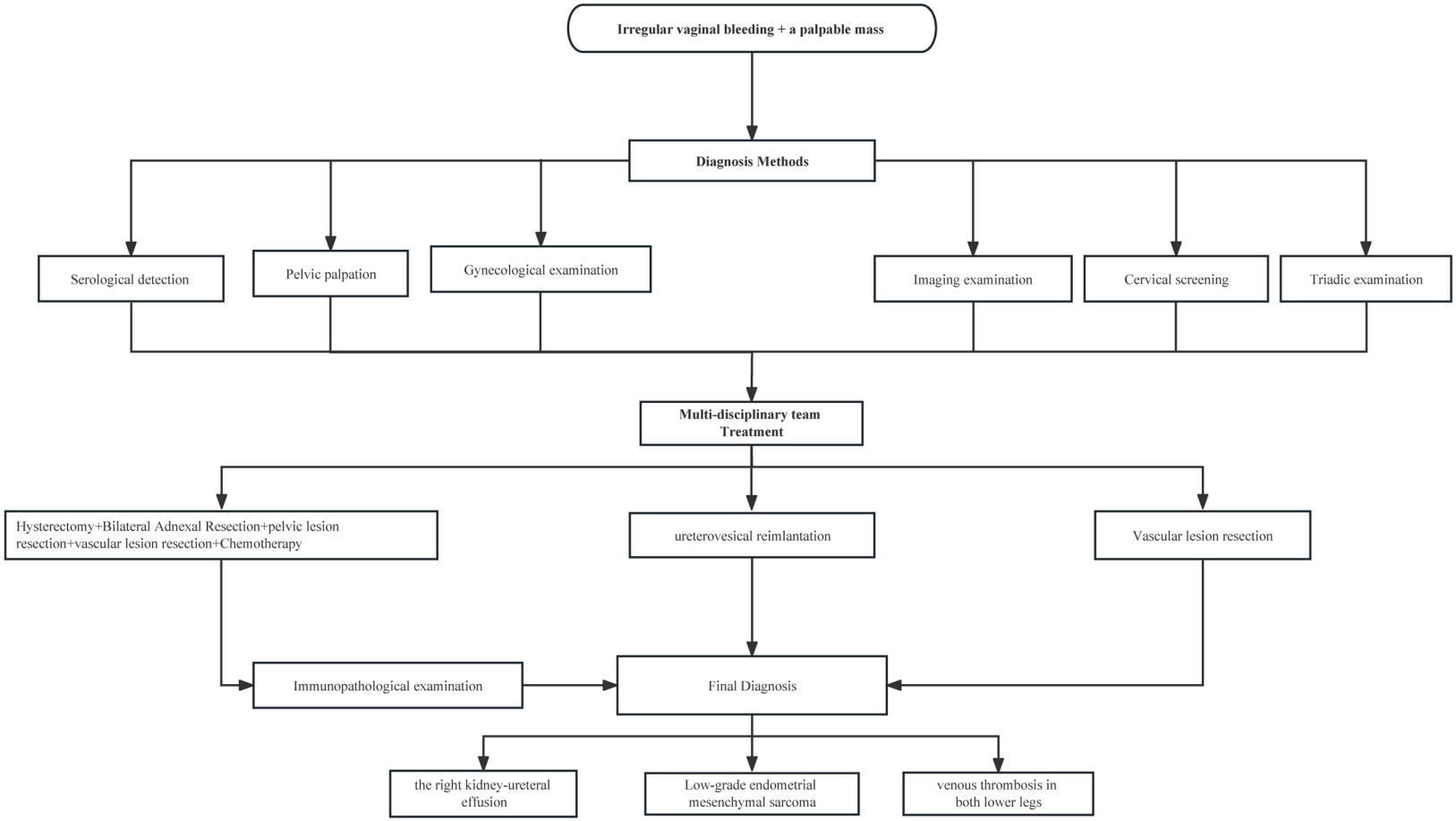

Figure 1. A schematic diagram of diagnosis and treatment.

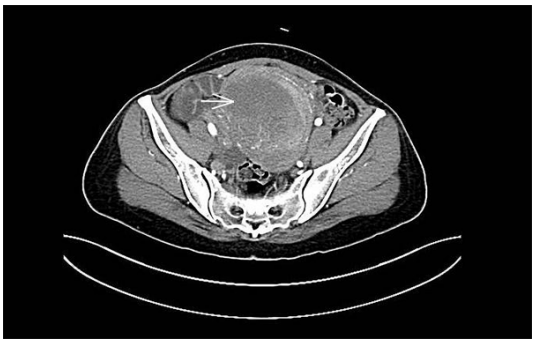

Figure 2. A significantly enlarged uterus with uneven density.

Figure 3. The right adnexal pattern was full and the right middle ureter was poorly demarcated from the lesion in the right adnexal region, and the right kidney and upper ureter above it were fluid-filled.

days, decreasing in intensity afterward and continuing until now. The patient was in good health in the past years and had a female delivery via the vagina and a lower uterine cesarean section delivery. There was no family history of hereditary disease or similar conditions. Gynecological examination showed a bulging abdomen, normal vulvar development, vaginal blood, smooth and hypertrophied cervix, with no lifting pain. Pelvic palpation showed a frozen pelvic shape, a uterus as large as the fourth month of pregnancy, and a palpable solid mass of about 10 cm in diameter, closely related to the uterine body, with no pressure pain. Triadic examination showed smooth rectal mucosa, lamellar thickening of the right parametrial tissue, hard and reaching the pelvic wall and no obvious abnormality was palpated on the left parametrium. Both cervical screening and squamous epithelial cell carcinoma-associated antigen tests were normal, but the patient's blood D-dimer was significantly higher than the normal level. The gynecologic ultrasound showed a large, hypoechoic mass in the uterus and a mixed echogenic area in the uterine cavity. Pelvic MRI showed a 7.0-cm-long, 9.0-cm-wide, and 13.5-cm-thick round-like mass with clear borders between the muscle walls of the right side of the uterus, with low signal in T1WI and slightly high signal in T2WI, uneven enhancement after enhancement, and a strip of low-signal non-enhancing areas seen within. The focal area adjacent to the union zone was blurred, and the right parametrial plexus traveled with a low signal T1WI and a high signal T2WI, suggesting a suspected uterine myoma involving the right parametrial plexus, accompanied by an intravascular thrombus in the inferior vena cava. The whole CT scan plus enhancement combined with the abdominal aortic CTA suggested a significantly enlarged uterus with uneven density, the right adnexal pattern was full and the right middle ureter was poorly demarcated from the lesion in the right adnexal region, and the right kidney and upper ureter above it were fluid-filled (**Figures 2** and **3**).

Because of the complexity of the patient's condition, a Multi-disciplinary Treatment (MDT) was employed to develop the treatment plan. Surgery revealed an enlarged uterus, as in the fourth month of pregnancy. The uterus and left adnexa were removed and sent for intraoperative freezing. The lesion invaded the right ureter, and the ureterovesical reimplantation was performed in collaboration with the urologist. Immunopathological examination confirmed low-grade endometrial mesenchymal sarcoma with CD10 (+), CyclinD1 (-), Desmin (+), SMA (-), SMMHC (-), ER (2+, 70-80%), PR (3+, 80-90%), and CK (-), Ki-67 (+30-40%) (**Figures 4** and **5**). Vascular cancer embolism was confirmed and the right adnexal and parametrial lesions, as well as the right internal iliac and inferior vena cava nodes, were found to be involved in the tumor. The right parametrial ligament was palpable and had a stiff occupancy, about 6 cm in diameter; the right parametrial lesion and right adnexa were removed; and the lesion invaded the right ureter. Local excision of the invaded ureter was completed in collaboration with urologists. Ureter-cyst reimplantation was performed and strips of stiff tissue were palpable in the parametrial vessels, right ovarian vein, right internal iliac vein, common iliac vein, and inferior vena cava; this was done in collabora-

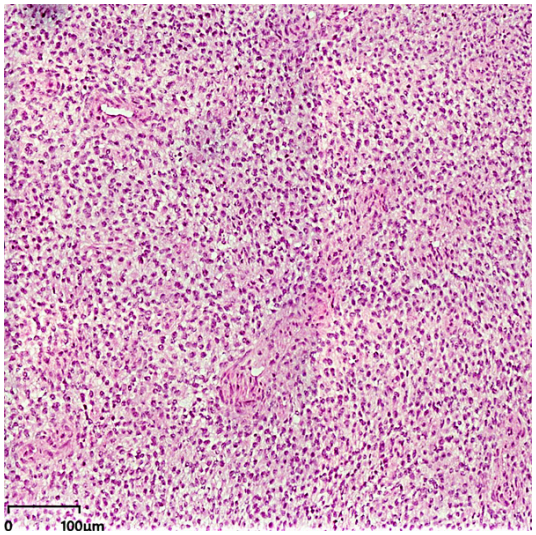

Figure 4. The tumor cells resemble normal endometrial mesenchymal cells in the proliferative phase and appear to swirl around the spiral artery-like blood vesls (Magnification: 10 × 10).

tion with the vascular and adnexal surgeons. The patient was discharged with anticoagulation treatment and was given rivaroxaban to treat venous thrombosis. After one month, the patient underwent cystoscopic removal of the right double J-tube and was treated with chemotherapy. The patient's final diagnosis was a low-grade endometrial mesenchymal sarcoma, with right kidney-ureteral effusion, and venous thrombosis in both lower legs. She is in good health with no tumor recurrence at the two-year postoperative follow-up.

Discussion and conclusion

Hypofractionated endometrial mesenchymal sarcoma (LG-ESS) is a rare endometrial mesenchymal tumor (EST), second only to uterine smooth muscle sarcoma as a subtype of uterine sarcoma in terms of incidence, with patients aged 18-83 years old with a mean age of onset of 46 years and a low degree of malignancy [2]. There are very few reports of LG-ESS invading the inferior vena cava or even the cardiac cavity, and symptoms such as chest tightness and shortness of breath can be seen in patients. A retrospective study reported eight patients with low-grade endometrial stromal sarcoma with intracaval or intracardiac extension. The median age at diagnosis was 44 years, with a range of 28 to 56 years. Abnormal uterine bleeding was the most commonly reported symptom (3/8), followed by low back discomfort (2/8), lower extremity edema (2/8), abdominal pain (1/8), and dyspnea (1/8). All patients underwent resection of the endovascular and extravascular portions of the tumor. Two patients were in stage IIIC, and six patients were in stage IVB. After surgery, four patients received adjuvant radiotherapy, three of whom also received letrozole. One patient was treated with letrozole alone, and one patient received methacholine. The mean follow-up time was 34.5 months, ranging from 6 months to 98 months; no patients died or relapsed during the follow-up period [4]. In this case, the tumor invaded the inferior vena cava in a striated form, masquerading as intravenous smooth muscle tumor disease, while the patient did not show respiratory or circulatory dysfunction. Symptoms were more insidious and difficult to diagnose through clinical symptoms. Furthermore, LG-ESS shows extensive morphologic differentiation, such as smooth muscle-like differentiation (the most common), interstitial differentiation of the sex cords, adipocytosis, osteoblast-like cells, fibroblast differentiation, skeletal muscle differentiation, or endometrial glandular differentiation, which makes it difficult to differentiate LG-ESS from intraventricular smooth muscle tumor disease only based on intraoperative findings and intraoperative pathology. Immunohistochemical findings, in this case, were consistent with LG-ESS. A combination of multiple immunomarkers is often necessary for a definitive diagnosis due to the wide morphologic differentiation of LG-ESS. The best immunohistochemical combination for the diagnosis of ESTs is IFITM1 or CD10 combined with h-Caldesmon staining, with a sensitivity of 86.7% and specificity of 93.9% [5]. A study followed up 27 patients with LG-ESS who did not undergo intraoperative laparotomy and 23 patients who did, and found that the pelvic and abdominal recurrence rates were 7.4%-31.4%, respectively, while the 5-year tumor-free survival rates were 55%-85%, but there was no significant difference in the 5-year overall survival rates between the two groups [6]. Patients with LG-ESS who had undergone laparotomy were prone to pelvic-abdominal metastasis, but the overall survival rate was not significantly reduced by remedial measures, such as reoperation or adjuvant therapy. Therefore, an intraoperative rapid cryopathological examination is recommended when LG-ESS is suspected, though negative rapid pathological results cannot completely exclude

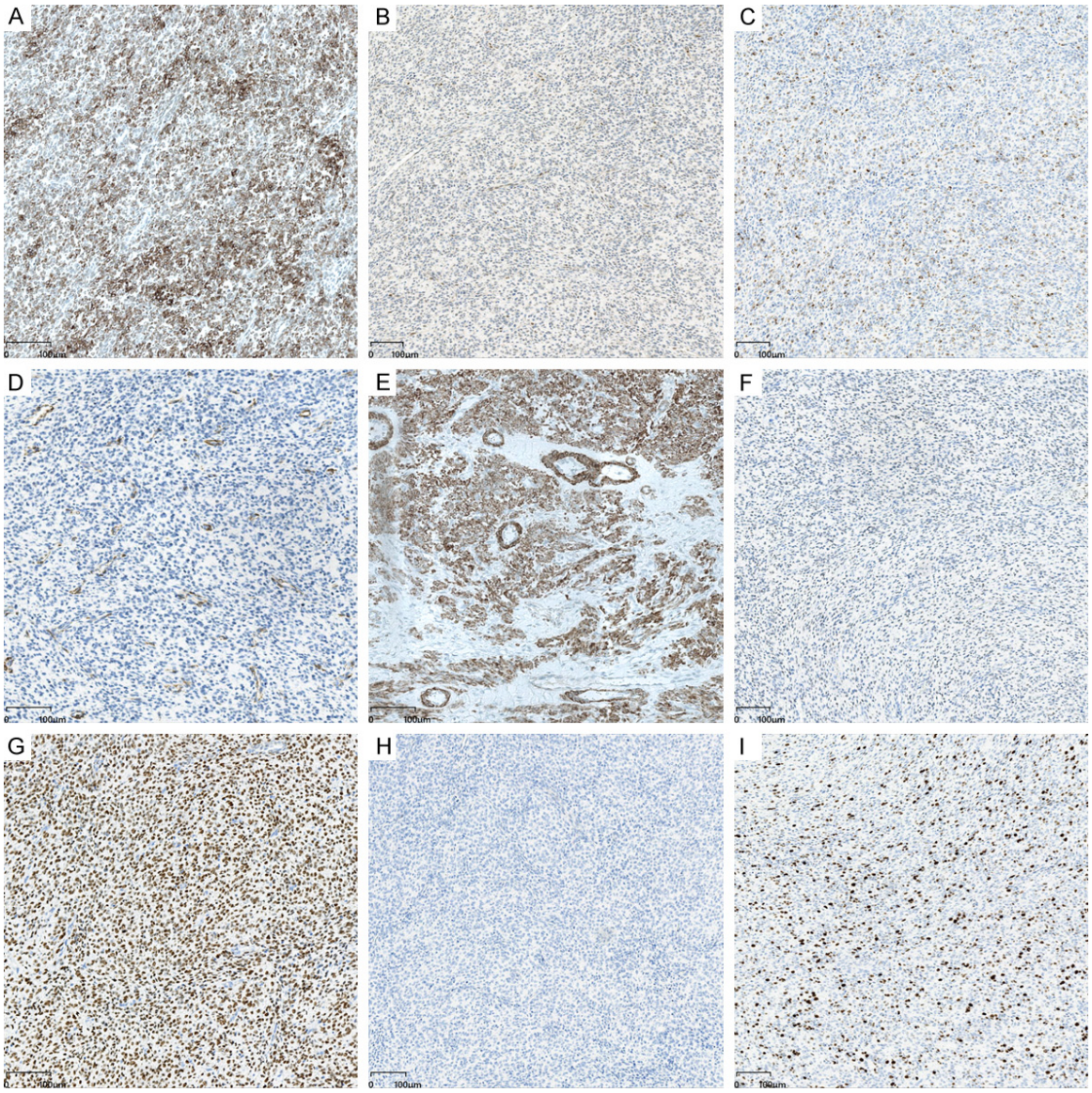

Figure 5. Immunohistochemical experiments showed CD10 (+), CyclinD1 (-), Desmin (+), SMA (-), SMMHC (-), ER (2+, 70-80%), PR (3+, 80-90%), CK (-), Ki-67 (+30-40%) (Magnification: 10 × 10). A: CD10 (+); B: CyclinD1 (-); C: Desmin (+); D: SMA (-); E: SMMHC (-); F: ER (2+, 70-80%); G: PR (3+, 80-90%); H: CK (-); I: Ki-67 (+30-40%).

LG-ESS due to the limitations of sampling and the pathologist's experience. Laparoscopic surgery with tumor Fractionation has a detrimental effect on the progression-free survival of early LG-ESS. Consequently, for patients with suspected LG-ESS, the transabdominal surgical route should be chosen, and even if the rapid pathology result is negative, the principle of tumor-free defense will still be strictly observed intraoperatively to reduce recurrence rates. In conclusion, when hypofractionated endometrial mesenchymal sarcoma invades blood vessels, it is often difficult to distinguish from an intraventricular vascular smooth muscle disease and must be differentially diagnosed based on carefully obtained histopathological findings, now commonly used in combination with immunoassay. In patients with suspected LG-ESS, even if the rapid pathological results are negative, adherence to the tumor-free defense principle should be observed intraoperatively to reduce recurrence risk.

Disclosure of conflict of interest

None.

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