

Durable response to eribulin in metastatic primary ovarian leiomyosarcoma: A case report

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Abstract. Primary ovarian leiomyosarcoma is an exceptionally rare malignancy that accounts for <0.1% of ovarian cancers; however, evidence regarding effective systemic therapy for advanced disease remains limited. Treatment strategies are generally extrapolated from uterine leiomyosarcoma or soft tissue sarcoma regimens; however, therapeutic outcomes are inconsistent. The current report describes the case of a 77-year-old female patient with International Federation of Gynecology and Obstetrics stage IVB primary ovarian leiomyosarcoma who presented with liver and humeral metastases. Following surgery, the patient underwent three cycles of combination therapy with docetaxel and gemcitabine, but the disease progressed. The patient discontinued treatment with pazopanib due to grade 3 dermatologic toxicity. Eribulin treatment was initiated because anthracyclines were contraindicated due to cardiac dysfunction. After seven cycles, the humeral metastases completely resolved, and the liver metastases remained stable, thereby achieving a partial response. Disease control was maintained for ~10 months without significant adverse events, with preservation of quality of life. After the 13th cycle, new hepatic and pulmonary metastases

developed and comprehensive genomic profiling revealed no actionable alterations. To the best of our knowledge, the present report is the first to demonstrate clinically meaningful and durable disease control using eribulin in advanced primary ovarian leiomyosarcoma.

Introduction

Primary ovarian leiomyosarcoma (POLMS) is an exceptionally rare malignancy that accounts for <0.1% of all ovarian cancers (1). Its clinical characteristics and optimal management remain poorly defined. Most available evidence consists of isolated case reports (2-6) or small retrospective series (7,8). A standardized therapeutic strategy for advanced or recurrent disease has not been established. Surgical resection is considered the mainstay of treatment; however, systemic therapy is typically based on protocols for uterine leiomyosarcoma (uLMS) and soft tissue sarcomas (9,10), with highly variable outcomes. Five-year survival rates for advanced POLMS remains below 20% (8), underscoring the aggressive nature of the disease and the urgent need for more effective treatment options.

Eribulin, a microtubule dynamics inhibitor with additional effects on tumor vasculature and epithelial-mesenchymal transition, has demonstrated clinical benefits in several soft tissue sarcoma subtypes. However, its efficacy in POLMS has not been clarified, and treatment selection for advanced cases with distant metastases remains challenging because of its extreme rarity.

In this paper, we report a case of International Federation of Gynecology and Obstetrics (FIGO) stage IVB POLMS with liver and bone metastases that achieved 10 months of disease control with eribulin after standard leiomyosarcoma-based therapies failed. To the best of our knowledge, no previous reports have documented a clinically significant response to eribulin in POLMS. Therefore, this case report provides valuable insights into potential therapeutic strategies for this rare and treatment-refractory malignancy.

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Abbreviations: CT, computed tomography; EMT, epithelial-mesenchymal transition; FIGO, International Federation of Gynecology and Obstetrics; MRI, magnetic resonance imaging; PD, progressive disease; POLMS, primary ovarian leiomyosarcoma; uLMS, uterine leiomyosarcoma

Key words: POLMS, eribulin, adjuvant chemotherapy

Case report

A 77-year-old woman (gravida 2, para 2) presented with a 1.5-year history of lower abdominal pain during defecation and a 3-month history of a palpable lower abdominal mass. During routine abdominal ultrasonography performed at her primary clinic for the follow-up of a cystic pancreatic lesion, an intrahepatic mass and pelvic ascites were detected. Contrast-enhanced computed tomography (CT) revealed a well-circumscribed, 2-cm, low-attenuation lesion in the liver and a solid, hypervascular mass in the pouch of Douglas. These findings raised the suspicion of ovarian malignancy. The patient was then referred to our department for further evaluation.

The patient was admitted to the University of Occupational and Environmental Health Hospital in May 2024. On admission, she was 154.6 cm tall and weighed 49.1 kg. Blood pressure was 116/54 mmHg, pulse 74/min, respiratory rate 18/min, and body temperature 36.0°C. Laboratory tests showed normal hepatic, biliary, and pancreatic functions. The patient's ALP level was 76 U/l (38~113 U/l), which was within normal limits throughout treatment. Tumor marker levels were within normal limits: CA125, 8.7 U/ml; estradiol, 7.2 pg/ml; and testosterone, 0.24 ng/ml. Pelvic examination revealed a large, firm, and poorly mobile mass reaching the umbilicus level. The cervix was displaced anteriorly toward the pubis owing to compression by the mass. Pelvic contrast-enhanced magnetic resonance imaging revealed a 15-cm solid tumor extending from the right uterine fundus to the Douglas pouch. The mass showed early heterogeneous enhancement on dynamic imaging and diffusion restriction (Fig. 1). Multiple leiomyomas were within the uterine myometrium; however, the Douglas pouch tumor exhibited clearly different imaging characteristics, suggesting ovarian cancer or uterine sarcoma arising from the serosal surface. The enhancement pattern and borders indistinct from adjacent organs indicated a high likelihood of malignancy.

Exploratory laparotomy was performed to clarify the relationship between the pelvic tumor and the intrahepatic lesion. Yellow and turbid ascites were present, but cytology was negative. The tumor originated in the right ovary and showed extensive inflammatory adhesions to the mesentery and pelvic peritoneum. However, no peritoneal dissemination was observed. Multiple fibroid nodules were observed in the uterus.

Intraoperative frozen section analysis of the ovarian mass revealed atypical spindle cells with infiltrative growth, marked nuclear pleomorphism, and frequent mitosis, consistent with leiomyosarcoma. Based on suspicion of a malignant ovarian tumor, the patient underwent total abdominal hysterectomy, bilateral salpingo-oophorectomy, and partial omentectomy. No peritoneal or intrahepatic lesions were observed intraoperatively. No significant lymphadenopathy was detected on preoperative CT. Given the patient's advanced age, lymphadenectomy was not performed. The operation lasted 2 h 58 min, with an estimated blood loss of 90 ml.

Histopathological examination revealed a spindle-cell pleomorphic tumor with marked atypia, abundant necrosis, and a mitotic count of 18/10 high-power fields. Immunohistochemistry showed positivity for α -SMA, desmin,

and h-caldesmon. No malignant lesions were identified in the uterus, which contained leiomyomas. The final diagnosis was a primary ovarian leiomyosarcoma (Fig. 2).

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) of the intrahepatic mass confirmed metastatic leiomyosarcoma (Fig. 3). Positron emission tomography (PET)-CT revealed mild uptake in the right humerus, and subsequent MRI and bone biopsy confirmed bone metastasis (Fig. 4). The final diagnosis was stage IVB primary ovarian leiomyosarcoma (pT1aNxM1b).

Postoperatively, chemotherapy was initiated, following uLMS protocols. Docetaxel plus gemcitabine was administered; however, after three cycles, new hepatic metastases appeared, and progressive disease (PD) was diagnosed. Pazopanib was initiated but discontinued because of grade 3 dermatologic toxicity, which caused difficulty in walking. Owing to heart failure with preserved ejection fraction, anthracyclines were avoided. The patient had a history of angina 13 years earlier; however, subsequent evaluations by cardiologists indicated that no further treatment was required. Therefore, Eribulin treatment was initiated in November 2024. Eribulin was administered in a 21-day cycle, with 1.4 mg/m² doses given on Day 1 and Day 8.

In April 2025, following seven cycles of eribulin treatment, CT imaging revealed the disappearance of humeral metastasis and stable hepatic metastases, which was consistent with a partial response (Fig. 4D). During eribulin treatment, the patient did not experience appetite loss or worsening of peripheral neuropathy. During eribulin treatment, the patient's weight remained stable at 46.0 kg $\pm$ 2 kg. After 3 cycles, transient neutropenia (Grade 3: CTCAE v6.0) was observed, with WBC: 2,500/ μ l and neutrophils: 562/ μ l; however, the patient recovered spontaneously. Liver and kidney function markers, such as AST, ALT, Cre, and BUN, remained within the normal range throughout the course of treatment. No elevation in cardiac biomarkers, including high-sensitivity troponin T or CK-MB, was detected. Eribulin maintained disease control for about 10 months without significant adverse events, and the patient's quality of life remained stable. In September 2025, following 13 cycles of eribulin treatment, new hepatic and pulmonary metastases developed, indicating PD (Fig. 5). After treatment with eribulin, the patient underwent three courses of Trabectedin but developed PD.

Given the resistance of POLMS to standard leiomyosarcoma-based chemotherapy and its rarity, comprehensive genomic profiling using FoundationOne CDx (Foundation Medicine, Cambridge, MA, USA) was performed to identify potential targeted therapies. A splice-site variant in TP53, 783-2A>C, was identified; however, no clinically actionable genomic alterations were detected overall, and systemic anticancer therapy was discontinued. Since then, the patient has been receiving palliative care at home for three months; however, the patient's general condition is rapidly worsening due to dyspnea and fatigue due to cachexia caused by metastatic lesions.

Discussion

In this case report, we describe 10 months disease control in advanced POLMS with eribulin. POLMS is an exceptionally rare malignancy (1). Treatment strategies for advanced disease remain undefined because of the limited number

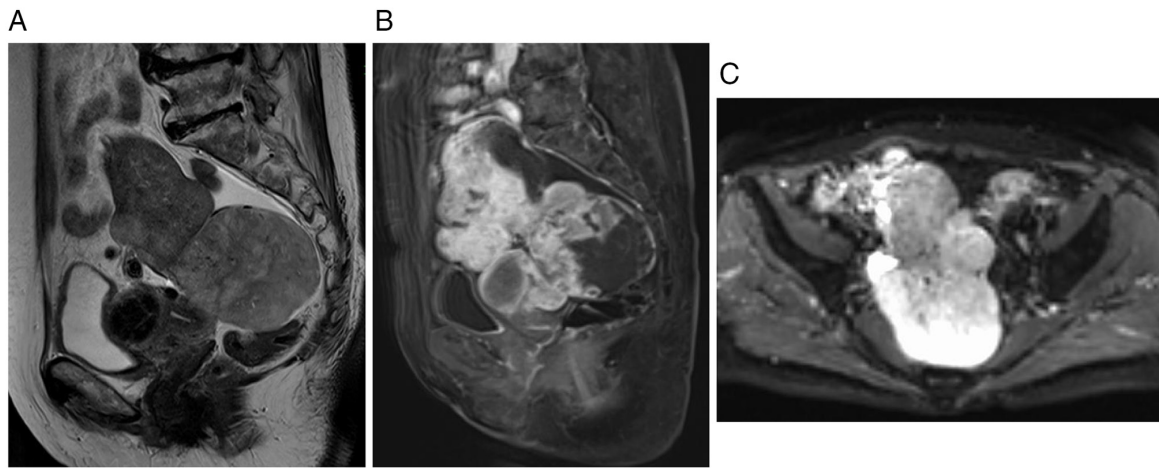


Figure 1. Pelvic MRI findings of the primary ovarian tumor. (A) T2-weighted sagittal MRI showed a 15-cm solid mass arising from the right ovary and extending into the pouch of Douglas. (B) Dynamic contrast-enhanced MRI demonstrated early heterogeneous enhancement. (C) Diffusion-weighted MRI showed marked diffusion restriction, which was consistent with a highly cellular malignant tumor. MRI, magnetic resonance imaging.

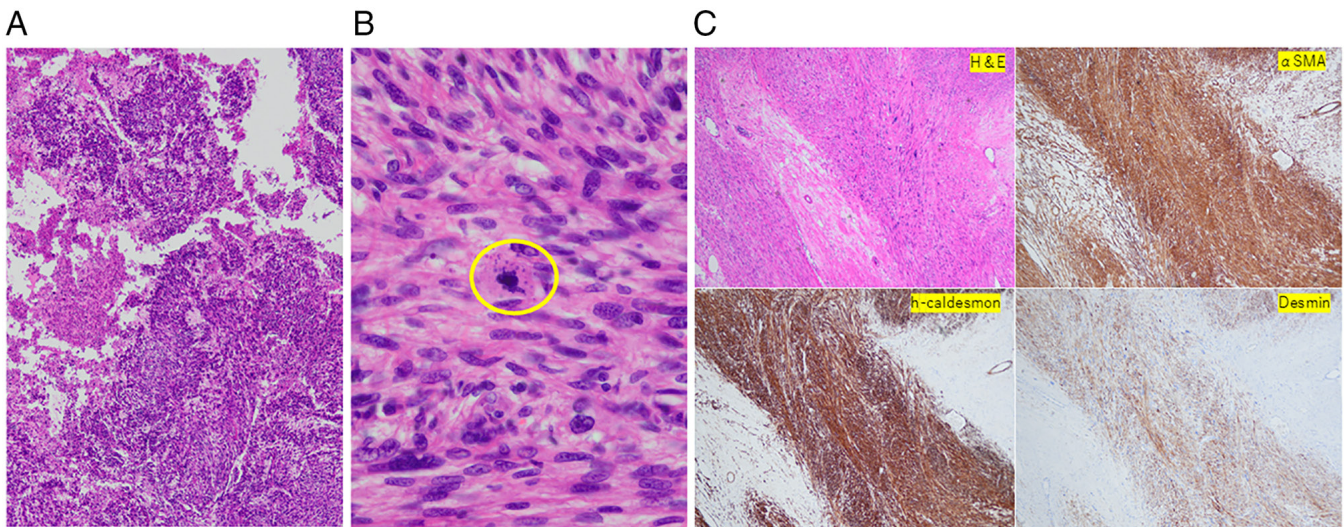


Figure 2. Histopathological features of the ovarian tumor. (A) H&E staining at low magnification (x4) showed densely proliferating spindle-shaped and pleomorphic tumor cells with necrosis. (B) H&E staining at high magnification (x40) demonstrated marked nuclear atypia and frequent mitoses (18 per 10 high-power fields). The yellow circle indicates a mitotic figure. (C) Immunohistochemistry showed diffuse positivity for α SMA, desmin and h-caldesmon at low magnification (x4), thereby confirming smooth muscle differentiation. α SMA, α -smooth muscle actin.

of reported cases. Most systemic therapies for POLMS are empirically extrapolated from treatment regimens used for uLMS or other soft-tissue sarcomas (9-11). Although the National Comprehensive Cancer Network guidelines recommend combination therapies such as ifosfamide with platinum agents or paclitaxel (12), their efficacy in POLMS remains inconsistent. Although the tumor was staged according to FIGO ovarian-carcinoma criteria, it should be noted that these staging guidelines were developed for epithelial ovarian cancers and have not been validated for primary ovarian leiomyosarcoma. In this report, FIGO staging was applied solely because the tumor originated in the ovary and provides a commonly used clinical framework for describing disease extent. Importantly, therapeutic decision-making was based on uterine leiomyosarcoma and soft-tissue sarcoma treatment principles, as no disease-specific guidelines exist for POLMS. In the present case, the patient had multiple poor

prognostic factors (7,8,10), including FIGO stage IVB disease, hematogenous metastases, and a high mitotic index; however, she achieved 10 months of disease control with eribulin after standard leiomyosarcoma-based therapies failed. To the best of our knowledge, no previous study has clearly demonstrated a clinically meaningful response to eribulin in POLMS.

Although eribulin has not been specifically approved for ovarian-origin leiomyosarcoma, its clinical efficacy in leiomyosarcoma as a broader entity has been demonstrated in several prospective trials. In particular, the phase III study by Schöffski *et al* (13) showed an overall survival benefit of eribulin in patients with advanced leiomyosarcoma. The clinical efficacy of eribulin in leiomyosarcoma has been demonstrated not only in the phase III trial by Schöffski *et al* (13), but also in several prospective phase II studies. Demetri *et al* (14) and Schöffski *et al* (15) reported antitumor activity and disease control in leiomyosarcoma cohorts treated with eribulin. Noujaim *et al* (16)

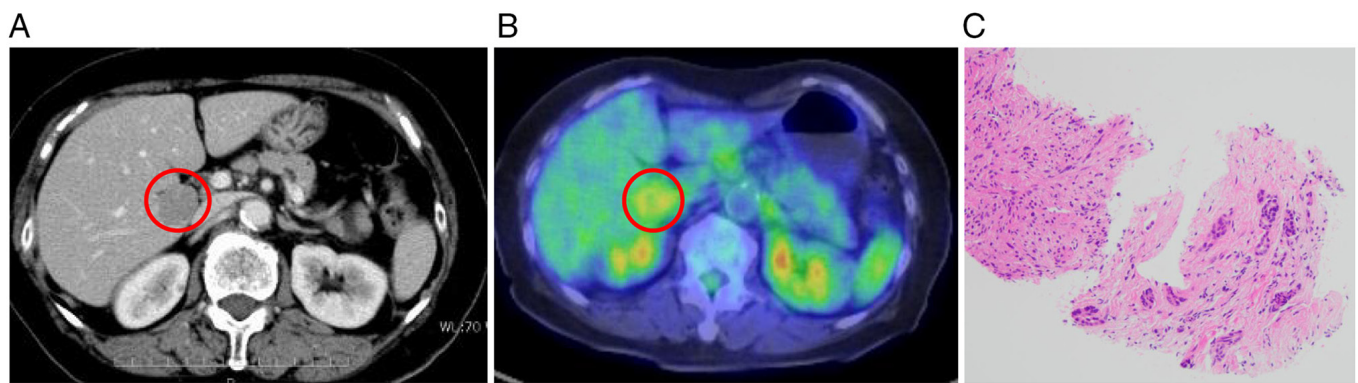


Figure 3. Imaging and cytopathology of the intrahepatic metastasis. (A) Contrast-enhanced CT showed a well-defined 2-cm low-density hepatic lesion, which was subsequently confirmed as a hepatic metastasis (red circle). (B) Positron emission tomography-CT demonstrated fluorodeoxyglucose uptake in the bone metastasis lesion indicated by the red circle (maximum standardized uptake value, 2.94). (C) Pathological specimen obtained by endoscopic ultrasound-guided fine-needle aspiration showing atypical spindle-shaped tumor cells infiltrating the stroma, leading to the diagnosis of bone metastasis (H&E staining; original magnification, x20). CT, computed tomography.

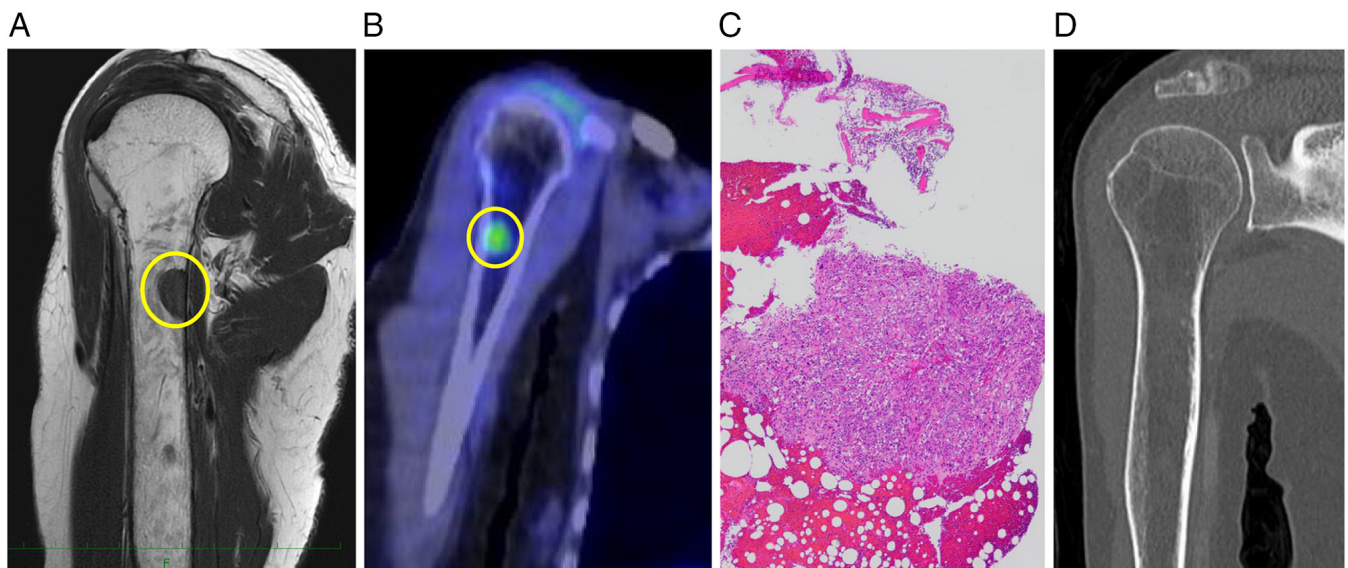


Figure 4. Right humeral metastasis and response to eribulin. (A) MRI showed an intramedullary lesion in the right humerus (yellow circle). (B) Positron emission tomography-computed tomography demonstrated increased fluorodeoxyglucose uptake within the lesion (maximum standardized uptake value, 2.94). The yellow circle indicates a bone metastasis. (C) Bone biopsy showed infiltration of atypical spindle-shaped tumor cells (H&E; magnification, x10). (D) Follow-up MRI after seven cycles of eribulin showed complete radiologic disappearance of the humeral metastasis. MRI, magnetic resonance imaging.

further confirmed its clinical benefit in a prospective study of advanced soft-tissue sarcomas. More recently, Haddox *et al* (17) demonstrated meaningful progression-free survival and clinical benefit in the leiomyosarcoma cohort of a prospective phase II trial evaluating eribulin combined with pembrolizumab. These findings collectively support the broader therapeutic activity of eribulin in leiomyosarcoma. Because POLMS is extremely rare and disease-specific clinical trials are not feasible, treatment strategies are generally extrapolated from uterine leiomyosarcoma. Therefore, the use of eribulin in the present case was based on established evidence in leiomyosarcoma, and the durable disease control observed in our patient is consistent with the therapeutic activity reported in these studies.

The biological behavior of POLMS explains its therapeutic challenges. Previous studies suggest that POLMS frequently exhibits abundant stroma, irregular vasculature (7), and a tendency toward hematogenous rather than peritoneal

dissemination, which are features that resemble uterine LMS more than epithelial ovarian cancer (8). Genomic analyses have also reported high frequencies of *TP53* and *PTEN* mutations (18), as well as alterations in homologous recombination repair-related genes, indicating substantial genomic instability. These characteristics contribute to chemoresistance and the limited efficacy of conventional regimens such as taxanes, gemcitabine-based combinations, and pazopanib (19). In reports on drug therapy for advanced or recurrent POLMS cases, the disease control period after docetaxel plus gemcitabine therapy is reportedly 4-12 months (12).

By contrast, several mechanisms may account for the favorable response to eribulin observed in this patient. First, eribulin induces vascular remodeling and improves intratumoral perfusion (20-23), thereby enhancing drug delivery. Given the abundant stroma and heterogeneous vascularity often observed in POLMS, vascular normalization contributes

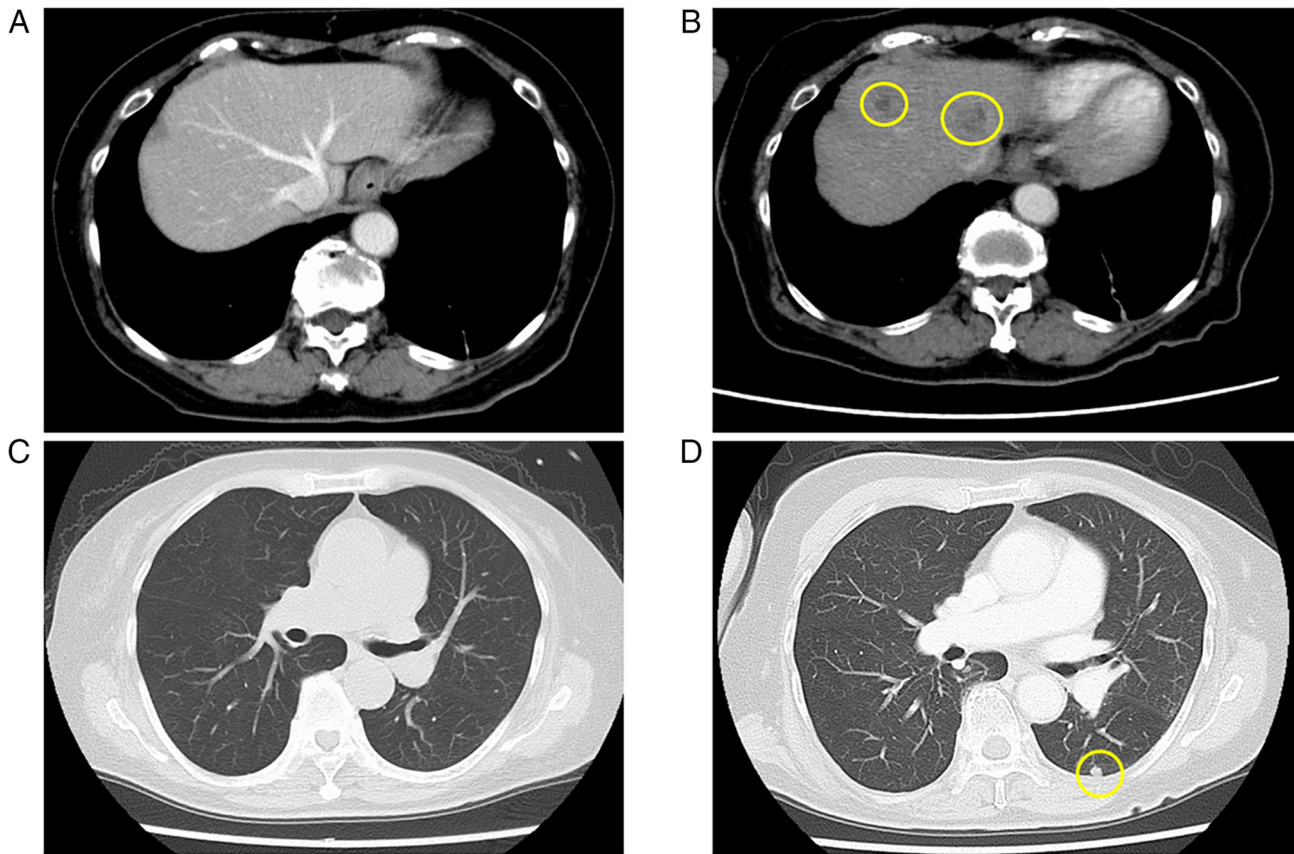


Figure 5. CT findings before treatment and at the time of metastatic progression during eribulin therapy. (A) Baseline axial contrast-enhanced CT image of the liver obtained before therapy, showing no metastatic lesions. (B) Axial CT image of the liver demonstrating newly developed hepatic metastases (yellow circles), indicating progressive disease during eribulin treatment. (C) Baseline axial CT image of the lungs prior to treatment, showing no pulmonary metastases. (D) Axial CT image of the lungs revealing a newly appeared pulmonary metastatic nodule (yellow circle), consistent with progressive disease under eribulin treatment. CT, computed tomography.

to a marked response, particularly in hematogenous metastatic sites. Second, eribulin suppresses the epithelial-mesenchymal transition, thereby reducing tumor cell motility and invasiveness (20-22). The complete disappearance of humeral metastases suggests that epithelial-mesenchymal transition inhibition has a role in controlling metastatic tumor cell plasticity. However, suppression of epithelial-mesenchymal transition (EMT) by eribulin has been reported primarily in epithelial malignancies, and applying this mechanism directly to leiomyosarcoma, a mesenchymal neoplasm, requires cautious interpretation. Eribulin exerts multiple biological effects beyond EMT modulation, including alterations in cytoskeletal dynamics, reduced cellular motility, and remodeling of the tumor microenvironment. These broader mechanisms may have contributed to the disappearance of bone metastasis and the sustained disease control observed in the present case. Rather than strictly applying the conventional EMT framework, it is more appropriate to interpret that eribulin may influence tumor cell plasticity and invasiveness even in sarcomas through these multifaceted biological actions. Third, *TP53* mutations, which are frequently reported in POLMS, have been associated with increased sensitivity to microtubule-targeting agents, potentially augmenting the therapeutic effects of eribulin (24). Finally, the predominance of hematogenous metastases in this case may have facilitated drug accessibility, further supporting the observed response.

Taken together, these findings suggested that eribulin is suitable for the tumor microenvironment and genomic background of POLMS. Although prospective studies are unlikely owing to the rarity of this disease, the accumulation of additional cases and molecular data will be essential to clarify the therapeutic role of eribulin and to identify biomarkers predictive of a response. Future research should also explore the potential utility of poly(ADP-ribose) polymerase inhibitors in patients with homologous recombination repair pathway alterations and evaluate targeted therapies for recurrent genomic abnormalities such as FGF or PDGFRB mutations.

In conclusion, to the best of our knowledge, this case provides the first evidence that eribulin can achieve durable disease control in patients with advanced POLMS. These findings highlight the need for individualized treatment approaches and may contribute to expanding therapeutic options for this rare and treatment-refractory malignancy.

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Availability of data and materials

The NGS data generated in the present study may be found in the Center for Cancer Genomics and Advanced Therapeutics (C-CAT) repository under accession number EC00639893. C-CAT is a controlled-access repository, and individual case-level data are not publicly available via a direct URL. Access to C-CAT data requires institutional ethics approval, submission of a formal data use application, review by the C-CAT Data Utilization Review Board and completion of a data use agreement. The other data generated in the present study may be requested from the corresponding author.

Authors' contributions

AN and TK contributed to the conception and design of the study, acquisition of data, and analysis and interpretation of data, and drafted the manuscript. SI, HK and SH contributed to the analysis and interpretation of data, and critically revised the manuscript for important intellectual content. SS and MH performed the pathological diagnosis, contributed to the interpretation of the pathological findings, and critically revised the manuscript for important intellectual content. HH, YM and KY contributed to the literature review, interpretation of the findings in the context of the existing literature, assessment of the scientific significance of the case report, and critical revision of the manuscript for important intellectual content. AN and TK confirm the authenticity of all the raw data. All authors read and approved the final version of the manuscript.

Ethics approval and consent to participate

The present case report was approved by the Ethics Committee of Medical Research at the University of Occupational and Environmental Health (approval no. H30-160; Fukuoka, Japan).

Patient consent for publication

Written informed consent for publication of the clinical data was obtained from the patient.

Competing interests

The authors declare that they have no competing interests.

References

- Bouie SM, Cracchiolo B and Heller D: Epithelioid leiomyosarcoma of the ovary. *Gynecol Oncol* 97: 697-699, 2005.
- Taskin MI, Ozturk E, Yildirim F, Ozdemir N and Inceboz U: Primary ovarian leiomyoma: A case report. *Int J Surg Case Rep* 5: 665-668, 2014.
- Zhang Q, Wang K and Wang B: Primary ovarian leiomyosarcoma: A case report. *J Int Med Res* 52: 3000605241276807, 2024.
- Bahadur A, Mundhra R, Verma P and Phulware RH: Primary ovarian leiomyosarcoma in a woman with uterovaginal prolapse. *BMJ Case Rep* 15: e251733, 2022.
- Kani V, Arumugam S, Rajendran K and Esakki M: Smooth muscle surprise: Documenting a primary ovarian leiomyosarcoma case. *Cureus* 16: e69374, 2024.
- Khadjetou V, Cheikh TE, Haiba MVA, Cheikh MAA, Mouhamed BN and Abdi AB: Primary perimenarcheal ovarian leiomyosarcoma: A case report and review of the literature. *Int J Surg Case Rep* 94: 107094, 2022.
- Yuksel D, Cakir C, Kilic C, Karalok A, Kimyon G, Çötelci S, Boyraz G, Tekin ÖM and Turan T: Primary leiomyosarcoma of the ovary: A report of three cases and a systematic review of literature. *J Gynecol Obstet Hum Reprod* 50: 101825, 2021.
- Mandato VD, Torricelli F, Mastrofilippo V, Palicelli A, Costagliola L and Aguzzoli L: Primary ovarian leiomyosarcoma is a very rare entity: A narrative review of the literature. *Cancers (Basel)* 15: 2953, 2023.
- Furutake Y, Fukagawa T, Suga Y, Nagasawa T, Sato S, Omi H, Kagabu M, Chiba A, Shoji T, Takeuchi S, *et al*: Gemcitabine and docetaxel in a patient with primary ovarian leiomyosarcoma: A case report and review of literature. *Int Cancer Conf J* 7: 11-15, 2017.
- Kozłowski M, Nowak K, Kordek A and Cymbaluk-Płoska A: Therapeutic management of rare primary ovarian neoplasms: Carcinosarcoma, leiomyosarcoma, melanoma and carcinosarcoma. *Int J Environ Res Public Health* 18: 7819, 2021.
- Cojocaru E, Palahepitiva Gamage G, Butler J, Barton DP, Tay K, Fisher C, Messiou C, Miah AB, Zaidi S, Gennatas S, *et al*: Clinical management and outcomes of primary ovarian leiomyosarcoma-experience from a sarcoma specialist unit. *Gynecol Oncol Rep* 36: 100737, 2021.
- National Comprehensive Cancer Network (NCCN): NCCN clinical practice guidelines in 3 oncology 2026: Ovarian cancer. NCCN, Plymouth Meeting, PA, 2026. https://www.nccn.org/professionals/physician_gls/pdf/ovarian.pdf.
- Schöffski P, Chawla S, Maki RG, Italiano A, Gelderblom H, Choy E, Grignani G, Camargo V, Bauer S, Rha SY, *et al*: Eribulin versus dacarbazine in previously treated patients with advanced liposarcoma or leiomyosarcoma: A randomised, open-label, multicentre, phase 3 trial. *Lancet* 397: 1629-1637, 2021.
- Demetri GD, Schöffski P, Grignani G, Blay JY, Maki RG, Van Tine BA, Alcindor T, Jones RL, D'Adamo DR, Guo M and Chawla S: Activity of eribulin in patients with advanced liposarcoma demonstrated in a subgroup analysis from a randomized phase III study of eribulin versus dacarbazine. *J Clin Oncol* 35: 3433-3439, 2017.
- Schöffski P, Ray-Coquard IL, Cioffi A, Bui NB, Bauer S, Hartmann JT, Krarup-Hansen A, Grünwald V, Dumez H, Blay JY, *et al*: Activity of eribulin mesylate in patients with soft-tissue sarcoma: a phase 2 study in four independent histological subtypes. *Lancet Oncol* 12: 1045-1052, 2011.
- Noujaim J, Alam S, Thway K and Jones RL: Efficacy and safety of eribulin mesylate in advanced soft tissue sarcomas. *Indian J Med Paediatr Oncol* 37: 125-130, 2016.
- Haddox CL, Nathenson MJ, Mazzola E, Lin JR, Baginska J, Nau A, Weirather JL, Choy E, Marino-Enriquez A, Morgan JA, *et al*: Phase II study of eribulin plus pembrolizumab in metastatic soft-tissue sarcomas: clinical outcomes and biological correlates. *Clin Cancer Res* 30: 1281-1292, 2024.
- Bruno M, De Paolis E, Minucci A, Piermattei A, Maneri G, Santoro A, Zannoni G, Scambia G, Sassu CM, Ciccarone F, *et al*: Comprehensive genomic profiling and clinico-pathologic characterization of primary ovarian leiomyosarcoma. *Int J Gynecol Cancer* 35: 102010, 2025.
- Plesselova S, Calar K, Axemaker H, Sahly E, Bhagia A, Faragher JL, Fink DM and de la Puente P: Multicompartmentalized microvascularized tumor-on-a-chip to study tumor-stroma interactions and drug resistance in ovarian cancer. *Cell Mol Bioeng* 17: 345-367, 2024.
- Hassoun Z, Wilkinson N, Takahashi-Ruiz L, Mukherjee N and Risinger AL: Abstract 5259: Mechanistic evaluations of the immunological and cell biological effects that distinguish eribulin from other microtubule-targeted chemotherapeutics. *Cancer Res* 84 (6 Suppl): S5259, 2024.
- Cortes J, Schöffski P and Littlefield BA: Multiple modes of action of eribulin mesylate: Emerging data and clinical implications. *Cancer Treat Rev* 70: 190-198, 2018.
- Kashiwagi S, Asano Y, Goto W, Takada K, Takahashi K, Hatano T, Tanaka S, Takashima T, Tomita S, Motomura H, *et al*: Mesenchymal-epithelial transition and tumor vascular remodeling in eribulin chemotherapy for breast cancer. *Anticancer Res* 38: 401-410, 2018.
- He B, Wood KH, Li ZJ, Ermer JA, Li J, Bastow ER, Sakaram S, Darcy PK, Spalding LJ, Redfern CT, *et al*: Selective tubulin-binding drugs induce pericyte phenotype switching and anti-cancer immunity. *EMBO Mol Med* 17: 1071-1100, 2025.
- Wozniak A, Boeckx B, Modave E, Weaver A, Lambrechts D, Littlefield BA and Schöffski P: Molecular biomarkers of response to eribulin in patients with leiomyosarcoma. *Clin Cancer Res* 27: 3106-3115, 2021.



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