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Disseminated Peritoneal Leiomyomatosis Mimicking Pelvic Malignancy: A Case Report

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ABSTRACT

Disseminated peritoneal leiomyomatosis (DPL) is a rare benign condition characterized by multiple smooth muscle nodules throughout the peritoneum. We report a 36-year-old woman presenting with vaginal bleeding and a large pelvic mass. Preoperative MRI raised concern for malignancy, including leiomyosarcoma. Surgical and histopathological evaluation, however, revealed a benign uterine leiomyoma, an ovarian fibroma, and multiple omental smooth muscle nodules consistent with DPL. Notably, the patient had no history of prior uterine morcellation. This case underscores the importance of histopathological and immunohistochemical confirmation to differentiate DPL from malignant processes, preventing overtreatment and guiding appropriate management.

Introduction

Disseminated peritoneal leiomyomatosis (DPL) is a rare benign condition characterized by multiple smooth muscle nodules along the peritoneal and omental surfaces [1]. Although histologically benign, it may radiologically and clinically mimic malignant peritoneal disease, including carcinomatosis and leiomyosarcoma [2]. DPL predominantly affects reproductive-aged women and has been linked to hormonal exposure, pregnancy, uterine leiomyomas, prior gynecologic surgery, and laparoscopic morcellation, though sporadic cases also occur [3]. Its pathogenesis is incompletely understood, with proposed mechanisms including metaplasia of submesothelial mesenchymal cells, hormonal influence, and iatrogenic dissemination of leiomyomatous tissue [4]. Radiologically, DPL may present as multiple peritoneal nodules or a dominant pelvic mass, which becomes alarming when accompanied by irregular borders, central degeneration, or mass effect on adjacent organs, complicating differentiation from malignancy before pathological evaluation. Histopathology remains the diagnostic cornerstone, typically showing bland

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spindle-shaped smooth muscle cells, low mitotic activity, and no significant atypia or coagulative necrosis, with immunohistochemistry commonly confirming smooth muscle differentiation [5,6]. Here, we present a case of DPL in a young woman whose suspicious pelvic mass raised concern for leiomyosarcoma or atypical pedunculated leiomyoma. Final evaluation confirmed a benign uterine leiomyoma, ovarian fibroma, and DPL, with negative peritoneal washing cytology.

Case Presentation

A 36-year-old woman (gravida 2, para 1, living 1), with a background of hypothyroidism and systemic lupus erythematosus under stable medical management (hydroxychloroquine, levothyroxine, folic acid), presented with a 2-month history of irregular vaginal bleeding without abdominal pain or dysmenorrhea. Her surgical history was notable only for a prior cesarean delivery, with no history of myomectomy or other uterine surgery, and no known gynecologic malignancy. Examination revealed a palpable pelvic-abdominal mass in the right lower quadrant. Laboratory tests showed mild anemia (hemoglobin, 11 g/dL) with a normal platelet count; serum β-hCG was negative, and tumor markers (CA125, CEA, CA19-9, LDH, inhibin A) were all within normal limits.

Pelvic ultrasonography identified a large, heterogeneous mass (116×71 mm) presumed to arise from the uterus. Subsequent MRI revealed a larger, irregularly marginated mass (160×133×90 mm) exerting mass effect on the uterus, with central necrosis-like signal change and a characteristic claw sign-the myometrium curving around the lesion-supporting a uterine origin (Figure 1). Focal areas of relatively high T2 signal intensity raised concern that leiomyosarcoma could not be excluded; however, the predominantly low T2 signal of the solid component and lack of convincing diffusion restriction favored a degenerating leiomyoma over a hypercellular malignant tumor. MRI additionally identified a smaller subserosal myoma (18×38×32 mm) in the right lateral uterine wall and a solid left ovarian mass (41×26 mm), for which the differential included ovarian leiomyoma

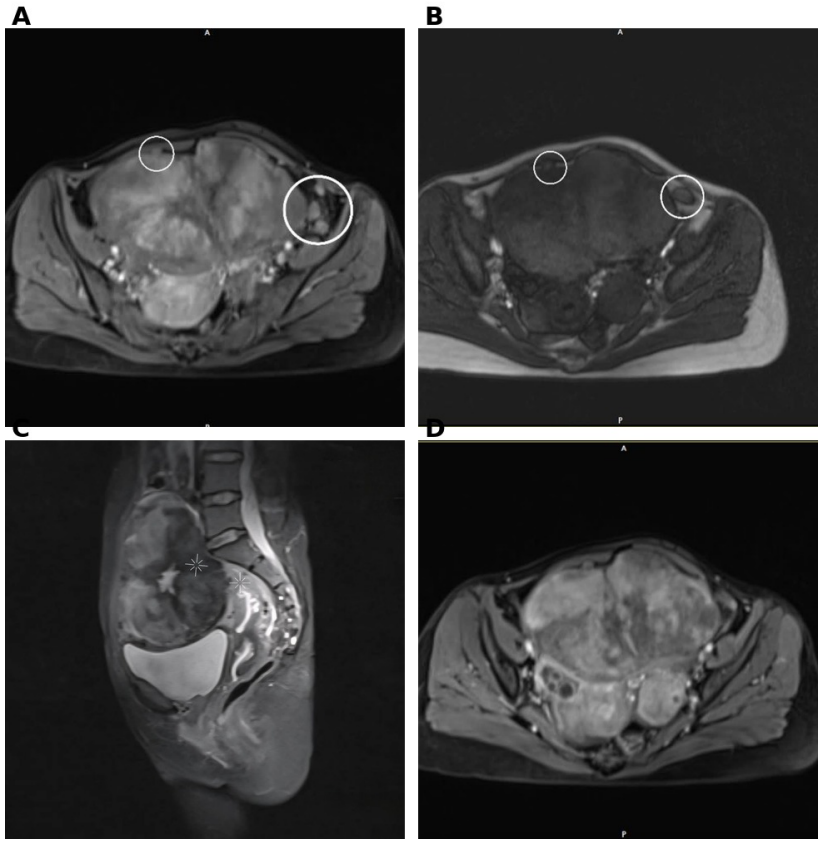

Fig 1. Preoperative MRI. (A) Axial image showing the large uterine mass with the "claw sign" (myometrium wrapping the lesion) and well-circumscribed omental/peritoneal nodules without ascites, classic for DPL. (B) Axial T2-weighted image showing omental nodules with low T2 signal, reflecting dense, hypocellular smooth-muscle bundles typical of leiomyoma rather than a more cellular malignant process. (C) Sagittal STIR image showing the same mass with predominantly low T2 signal and central necrosis anterior to the uterus; focal high-T2 areas raised concern for leiomyosarcoma, but the overall pattern and lack of diffusion restriction favored a degenerating leiomyoma. (D) Post-contrast image showing two enhancing bilateral pelvic masses, the larger left-sided one appearing to arise from the ovary, raising the differential of a pedunculated FIGO type 7 leiomyoma.

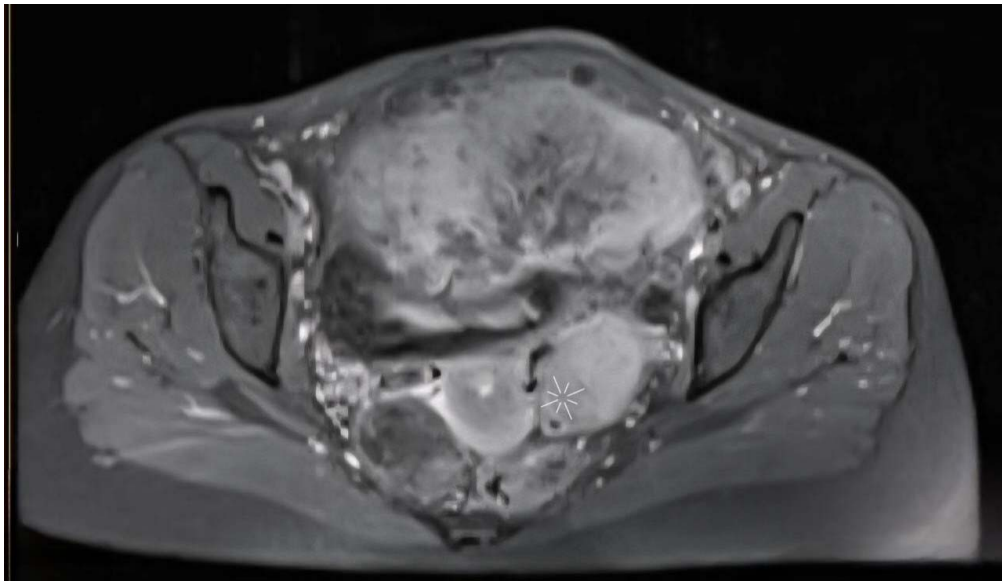

Fig. 2. Post-contrast fat-suppressed T1-weighted image showing a well-defined, avidly enhancing solid mass adjacent to a left ovarian follicle (*), suggesting ovarian origin.

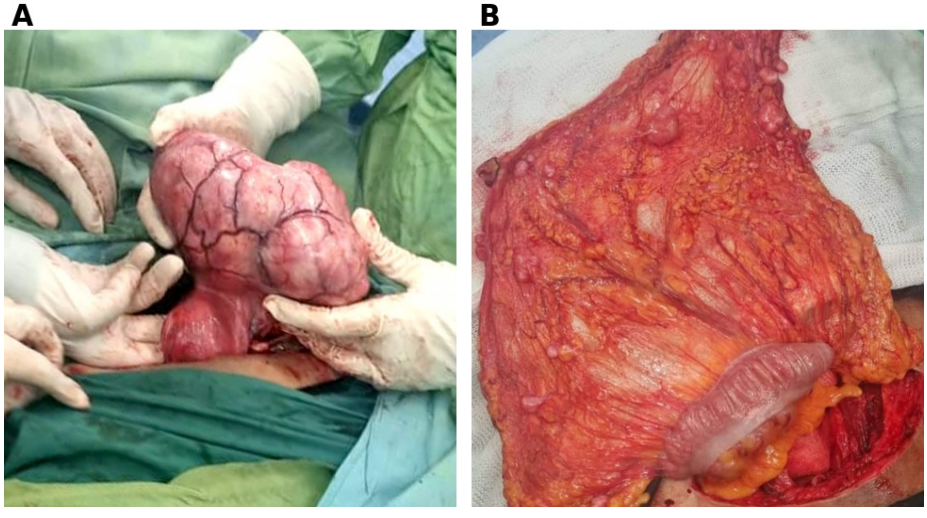

Fig. 3. Intraoperative photographs. (A) The excised multilobed uterine myoma with exophytic growth and prominent surface vessels. (B) Multiple omental and peritoneal nodules of varying sizes, the typical appearance of DPL, which can mimic peritoneal carcinomatosis but generally follows a benign course.

and fibrothecoma (Figure 2). Given the discordance between the size/necrotic appearance of the dominant mass and its otherwise benign profile, together with the coexisting solid ovarian lesion, surgical exploration was recommended. The preoperative differential diagnosis included leiomyosarcoma, degenerated leiomyoma, and a benign ovarian stromal tumor (fibroma/fibrothecoma).

Fertility-preserving options and the potential need for more extensive surgery were discussed preoperatively. Intraoperatively, a large necrotic pelvic mass (16 cm) and a 4-cm solid left ovarian lesion were identified (Figure 3). Given the preoperative suspicion of malignancy, intraoperative frozen sections were prepared, reporting the ovarian mass as benign fibrothecoma and the uterine mass as myoma; however, definitive assessment of the ovarian lesion was deferred to permanent histopathological examination. Based on these findings, uterine myomectomy and left salpingo-oophorectomy were performed to completely remove the ovarian lesion while avoiding unnecessary radical surgery, with the uterus and contralateral ovary preserved to maintain fertility and endocrine function. Peritoneal lavage fluid was collected for cytology, and biopsies of the omental and peritoneal nodules were obtained for definitive histopathology.

Grossly, the left salpingo-oophorectomy specimen

Table 1. Immunohistochemistry

Marker	Uterine lesion	Ovarian lesion	Omental nodules
Smooth muscle actin	Positive	—	Positive
Desmin	Positive	—	Negative
Inhibin	Negative	—	Negative
H-caldesmon	Negative	—	Not stated
WT1	—	Positive	Negative
CD117 / CD99	—	—	Negative
Ki-67 index	<5%	—	—

Desmin negativity in the omental nodules, while atypical for conventional leiomyoma, is a recognized finding in DPL and does not exclude smooth muscle differentiation.

Table 2. This timeline of the patient's clinical course

Time point	Clinical event
Symptom onset	The patient developed vaginal bleeding, which prompted further evaluation.
Initial imaging	Pelvic imaging revealed a 16 cm pelvic mass, a 4 cm left ovarian mass, and multiple omental nodules suspicious for malignancy.
Surgical intervention	Exploratory surgery was performed because of the radiologic concern for a malignant pelvic tumor.
Intraoperative frozen section	Frozen section of the ovarian mass showed benign fibrothectoma; the uterine mass was consistent with benign leiomyoma, with no evidence of malignancy.
Final pathology	Histopathologic examination confirmed disseminated peritoneal leiomyomatosis (DPL) with associated benign uterine leiomyoma and ovarian fibroma.
Postoperative management	No adjuvant hormonal therapy was prescribed. A surveillance-only strategy was selected.
Follow-up	Clinical examination and pelvic ultrasound were performed every 3 months. At 10 months of follow-up, the patient remained asymptomatic with no evidence of recurrence.

contained a well-circumscribed, solid, white ovarian lesion (4.5 cm). The uterine myomectomy specimen was a multinodular mass (16×13×5 cm) with a homogeneous, firm, cream-colored cut surface. The omentum contained multiple similar nodules, the largest 1.5 cm. Microscopically, the ovarian lesion showed a well-circumscribed spindle cell proliferation in storiform patterns with bland nuclei and rare mitoses—diagnostic of ovarian fibroma (Table 1). The uterine and omental lesions shared a uniform profile: fascicular, bland spindle-shaped smooth muscle cells with low-to-moderate cellularity and no hypercellular or dedifferentiated foci. Nuclear atypia, pleomorphism, coagulative necrosis, and lymphovascular invasion were absent in all specimens, and mitotic activity was low (1–2/10 HPF), supporting a benign diagnosis for both the uterine leiomyoma and the omental DPL. Peritoneal washing cytology showed no malignant cells.

Final Diagnoses

- Left salpingo-oophorectomy: Ovarian fibroma; normal fallopian tube
- Uterine myomectomy specimen: Leiomyoma
- Omental specimen: DPL
- Peritoneal washing cytology/cell block: No evidence of malignancy

Given the benign frozen-section findings and subsequent confirmation of DPL without malignant features, no adjuvant hormonal therapy (e.g., GnRH agonists or aromatase inhibitors) was initiated, reflecting both the completeness of resection and the patient's preference. Recovery was uneventful, and the patient was discharged on postoperative day 2. A surveillance protocol of clinical examination and pelvic ultrasonography every 3 months was implemented. At 10-month follow-up, the patient remained asymptomatic with no radiologic evidence of recurrence or growth of residual small peritoneal nodules (Table 2).

Discussion

DPL is a rare benign smooth-muscle proliferation

Table 3. Key features of previously reported DPL cases compared with the present case

Study	Key Features	Prior Surgery / Morcellation	Ovarian Findings	Clinical Significance
Disseminated Peritoneal Leiomyomatosis (12)	Recurrent DPL after TAH-BSO	Yes	Not reported	Highlights hormonal influence on DPL recurrence.
Morcellation-induced leiomyomatosis peritonealis disseminata: a rare case report (13)	Morcellation-induced LPD	Yes	Not reported	Demonstrates the classic iatrogenic pathway of DPL.
Multiple extrauterine adenomyomas presenting in upper abdomen and pelvis: a case report and brief review of the literature (14)	Extrauterine smooth muscle lesions	Yes	Not reported	Focuses on the differential diagnosis of pelvic masses.
Present Case	Large pelvic mass + omental nodules	No	Ovarian fibroma	Illustrates a rare de novo DPL mimicking malignancy.

whose principal clinical importance lies in its capacity to mimic malignant peritoneal disease [7]. In this case, preoperative imaging raised concern for leiomyosarcoma or an atypical pedunculated leiomyoma because of lesion size, irregular margins, and necrosis-like change. Retrospective correlation indicated these features reflected extensive degeneration within a large uterine leiomyoma rather than true malignancy, reinforcing that imaging alone is often insufficient to distinguish benign degenerative change from sarcoma in large uterine and peritoneal smooth-muscle lesions [8-10].

Histopathology remains the diagnostic cornerstone. Both uterine and omental specimens showed fascicular spindle cells without significant atypia, pleomorphism, or coagulative necrosis, and a low mitotic index (1–2/10 HPF). The diagnosis of DPL rested on the convergence of diffuse SMA positivity, morphologic identity with the concurrent uterine leiomyoma, and absence of malignant histologic criteria. Attenuation of desmin and H-caldesmon in extrauterine deposits, although uncommon, is recognized in DPL and does not exclude the diagnosis [5, 6].

Given that the patient's only prior uterine surgery was cesarean delivery, an iatrogenic implantation mechanism was considered unlikely; the findings instead favored a hormonally driven or multifocal metaplastic process. Concurrent ovarian fibroma further compounded preoperative diagnostic uncertainty by closely mimicking advanced peritoneal carcinomatosis—an association rarely reported [11]. Intraoperative frozen section was pivotal, confirming benign histology and enabling uterus- and fertility-preserving surgery. Adjuvant hormonal therapy was withheld given complete resection, confirmed benign disease, and patient preference; structured surveillance was instituted instead. At 10-month follow-up, the patient remained asymptomatic without radiologic recurrence. Although prognosis is generally favorable, reported recurrence and rare malignant transformation justify long-term follow-up. This case underscores that accurate diagnosis of complex pelvic-peritoneal smooth-muscle masses requires integration of clinical history, imaging, intraoperative assessment, histopathology, and immunohistochemistry, and that a multidisciplinary, tissue-based approach can avert unnecessary radical surgery (Table 3).

Conclusion

DPL is a rare benign smooth-muscle proliferation that can closely mimic malignant peritoneal disease clinically and radiologically. In this case, the coexistence of a large degenerating uterine leiomyoma, an ovarian fibroma, and multiple peritoneal smooth-muscle nodules generated substantial preoperative concern for malignancy. Definitive diagnosis rested on intraoperative frozen-section assessment with subsequent histopathological and immunohistochemical correlation. The absence of significant cytologic atypia, coagulative necrosis, and increased mitotic activity, together with diffuse SMA positivity, supported a benign process despite focal attenuation of desmin and H-caldesmon in the peritoneal deposits. Systematic exclusion of benign metastasizing leiomyoma, parasitic leiomyoma, STUMP, endometrial stromal sarcoma, and peritoneal carcinomatosis was essential. Because the patient's only prior uterine intervention was cesarean delivery, an iatrogenic mechanism was considered unlikely; a hormonally driven or clonal metaplastic origin appears more plausible, although pathogenesis remains heterogeneous and was not confirmed molecularly (e.g., MED12 testing). Recognition of DPL

enabled conservative, fertility-preserving surgery and avoided unnecessary radical treatment. At 10-month follow-up, the patient remained asymptomatic without radiologic recurrence; given the potential for recurrence and rare malignant transformation, long-term surveillance remains warranted.

Ethical Considerations

Ethical Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. The research protocol was reviewed and approved by the Ethics Committee of Isfahan University of Medical Sciences (IR.ARI.MUI.REC.1405.091)

Patient Consent

Written informed consent has been obtained from the patient for publication of this case report and any accompanying clinical, radiologic, or pathologic information.

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Conflict of Interests

The authors have no conflict of interest to declare.

Author Contributions

All authors contributed to the clinical management, data collection, manuscript preparation, and final approval of the submitted version.

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