

Pedunculated Subserous Leiomyosarcoma Mimicking Ovarian Cancer: Case Report and Review of Literature

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Abstract

Pedunculated subserous leiomyosarcoma is a quite rare presentation of leiomyosarcoma. As of 2013, only three cases have been reported in the literature. In this case report, we document two new cases of pedunculated subserous leiomyosarcoma from uterine fundus. These two cases illustrate the difficulty of making a correct differential diagnosis between a pedunculated subserous uterine leiomyosarcoma and a malignant ovarian tumor before intervention. A review of the literature confirms that this site remains unusual and making the diagnosis is difficult.

Keywords: Leiomyosarcoma; Pedunculated; Uterine; Differentiation; Ovarian cancer; Subserous

Introduction

Uterine Leiomyosarcoma (LMS) is a rare gynecologic malignancy, comprising roughly 1% of all uterine malignancies and 25~36% of uterine sarcomas [1-3]. LMS is generally considered to be a highly malignant neoplasm, with a 5-years survival rate of 19% to 65% for all stages of the disease [4,5]. The most frequent symptoms of uterine LMS are abnormal vaginal bleeding and a palpable mass, followed by weight loss and weakness [2]. Preoperative and intraoperative differentiation between leiomyosarcoma and large leiomyoma is always challenging [6]; Therefore, leiomyosarcoma is often diagnosed during postoperative histologic evaluation of hysterectomy or myomectomy specimens.

The aims of this paper are: 1) Report on the rare presentation of two cases of uterine leiomyosarcoma mimicking ovarian cancer and 2) Review the literature of uterine leiomyosarcoma at this unusual site.

Case 1

The patient was a 49-years-old woman, gravida 2, para 2. She had no particular past history, nor was her family history notable. The patient felt abdominal distention. Several weeks later she visited her neighborhood physician, who suggested the possibility of a tumor in the pelvic cavity. She was then referred to our hospital. On clinical examination, a large adult head-sized tumor was palpated around the umbilical area toward the lower abdomen. Cytological diagnoses of the cervix and endometrium of the uterus was negative for malignancy. As for tumor markers, only CA125 was elevated, it was 305 U/ml. Other

tumor markers (CA19-9, CEA, and LDH) were within normal limits. Ultrasound examination revealed a large cystic tumor with an irregular shape and moderate ascites. Computed tomography (CT) revealed a multi-cystic tumor with solid components having an irregular shape of about 28 cm in largest diameter, but not showing any distant metastasis (Figure 1). Magnetic resonance imaging (MRI) also suggested a multi-cystic ovarian tumor with solid components enhanced with gadolinium contrast (Figure 2). We therefore strongly suspected that the tumor was an ovarian cancer. Based on these findings, the patient was subjected to a laparotomy with a preoperative diagnosis of ovarian cancer. At exploratory laparotomy, the tumor was found to have developed from the uterine fundus, resembling a pedunculated leiomyoma (Figure 3), and it was adhered to the bladder peritoneum. There was a small amount of ascites. No abnormality was found adnexae. Because the



Figure 1: CT scan shows a complex mass with solid and cystic components.



Figure 2: Sagittal MR image shows multi-cystic ovarian tumor with solid components.

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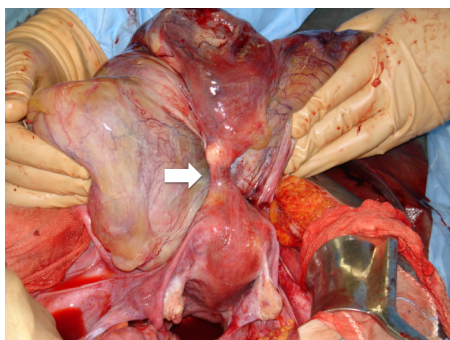


Figure 3: The uterus and a pedunculated tumor. Arrow indicates the steel between the uterus and the tumor.

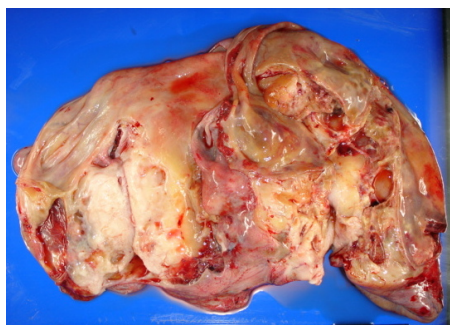


Figure 4: Cut section of the tumor.

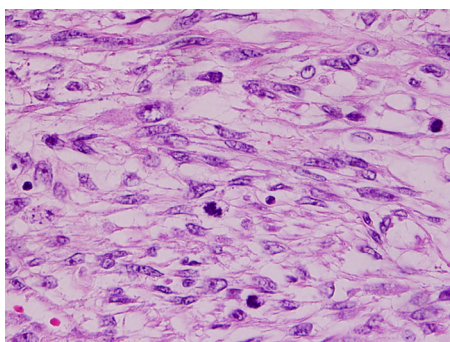


Figure 5: Histological findings of a uterine leiomyosarcoma.

adhesion between the uterine tumor and the bladder peritoneum was dense, we couldn't exclude tumor invasion into the bladder. We considered the possibility that co-resection of the tumor with a partial bladder wall removal would be safer than adhesiolysis to gain a clean surgical margin. We performed a tumorectomy, partial bladder resection and partial omentectomy. Macroscopically, the cut section revealed multiple septations and cavitations filled with serous brown fluid. There were two fist-sized yellow-whitish nodules inside of the cavity (Figure 4).

Cytological examination of the ascites was negative for malignant cells, and the intraoperative frozen-section examination of the tumor did not contain malignant cells. Therefore, we did not perform any additional procedures. Operation duration time was 235 min, blood loss was 1300 ml. The specimen weight was 9,840 g, including 7,100 ml of fluid contents. Although the postoperative course was uneventful,

the final pathological diagnosis was of a leiomyosarcoma of uterus. Histological examination revealed that the tumor had nuclear atypia and more than ten mitotic figures per 10 high-power fields. We diagnosed this tumor as a primary uterine leiomyosarcoma, mainly because we couldn't confirm a histological continuity between the tumor and the bladder (Figures 5 and 6).

Subsequently, we performed a total abdominal hysterectomy and bilateral salpingoophorectomy 2 months after the initial surgery. There was no residual leiomyosarcoma from the resected uterus. Taking into consideration the absence of an established treatment modality, we decided to discharge the patient and follow up without adjuvant therapy. After 4 years from initial surgery, she is doing well and with no evidence of recurrent disease.

Case 2

The patient was 58-years-old woman, gravida 2, para 2. She had no particular past history. The first clinical symptoms were abdominal pain and distention. On clinical examination, a large adult head-sized tumor was palpated from the supra umbilical area toward the lower abdomen. MRI revealed a heterogeneous tumor measuring 23×15×10 cm (Figure 7). A Positron Emission Tomography (PET) scan showed a huge intrapelvic tumor with intense FDG (fluorodeoxyglucose) uptake (SUV max=5.0) (Figure 8). As for tumor markers, only CA125 was elevated, it was up to 305 U/ml. The tumor markers CA19-9 and LDH were within normal limits. Preoperative diagnosis of the tumor

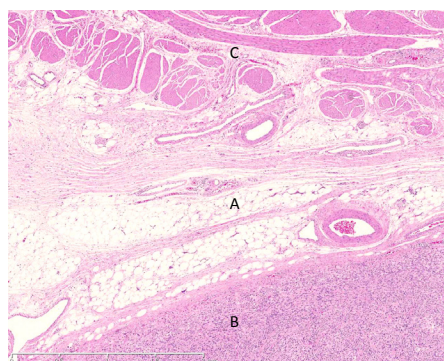


Figure 6: Histological assessment of a surgical sample
A) Fat tissue B) Intervenes between the tumor and C) the bladder.



Figure 7: Sagittal MR image shows multi-cystic ovarian tumor (arrow).

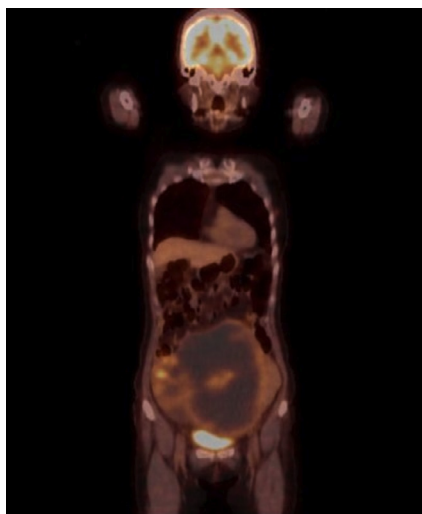


Figure 8: PET scan showed huge tumor with intense FDG uptake.

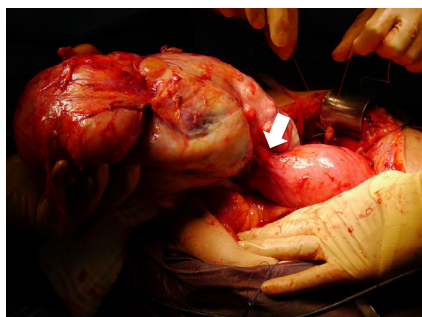


Figure 9: Arrow indicates the steel between the uterus and the tumor.

was ovarian tumor. At laparotomy, as with the first case, the tumor was found to have developed from the uterine fundus as a pedunculated leiomyoma and was adhered to the bladder peritoneum and small intestine (Figure 9). There was an abundance of ascites (1800 ml). Bladder injury occurred during the adhesiolysis. Total abdominal hysterectomy, bilateral salpingoophorectomy and bladder repair were performed. The operation time was 277 min, blood loss was 790 ml, and the weight of the specimen was 3,500 g. Although the diagnosis from the intraoperative frozen-section examination was of a degenerated leiomyoma, the final pathological diagnosis was of a leiomyosarcoma of the uterus. Histological examination revealed that the tumor had nuclear atypia and more than ten mitotic figures per 10 high-power fields (Figure 10). As with the first case, there was no histological continuity between the tumor and the bladder wall (Figure 11). We therefore diagnosed this tumor as a primary uterine leiomyosarcoma. After one year from the initial surgery, she is doing well, with no evidence of recurrent disease, in spite of having no adjuvant therapy.

Discussion

Uterine leiomyosarcoma is rare (3 to 7 cases per 100,000 in the United States population), with a poor prognosis. It represents 1.3% of all uterine malignancies and about 25% of uterine sarcomas [7-9]. Distinguishing between a uterine leiomyoma and a leiomyosarcoma continues to be difficult because the presenting symptoms of a benign leiomyoma closely resemble those of leiomyosarcoma. There is no pelvic imaging technique that can reliably differentiate between a

benign leiomyoma and a uterine sarcoma. As for clinical symptoms, a leiomyoma and a uterine sarcoma appear very similar, both are focal masses within the uterus and both often have central necrosis.

MRI may be helpful in women when there is a suspicion of sarcoma; however, it does not provide a definitive diagnosis. Neither is high signal intensity a reliable indicator of uterine sarcoma [10]. A consistent finding for leiomyosarcoma is the absence of calcifications [10]. Some reports suggest that an ill-defined margin is consistent with a sarcoma [11]. Two small studies using different techniques of MRI with gadolinium contrast have reported specificities of 93% to 100% and positive predictive values of 53% to 100% [12,13]. Sonographic evaluation of the uterine mass may identify features suggestive of sarcoma (mixed echogenic and poor echogenic parts, central necrosis, and Color Doppler findings of irregular vessel distribution, low impedance to flow, and high peak systolic velocity); however, many of these characteristics may also be found in benign leiomyomas [10]. Computed tomography does not reliably differentiate between leiomyomas and uterine sarcomas [14]. Positron emission tomography/computed tomography with fluorodeoxyglucose does not appear to be useful for distinguishing between leiomyoma and uterine sarcomas. While FDG uptake is generally high in sarcomas (mean SUVs; 6.4 ± 4.3 (SD)) [15] and low in leiomyomas (mean SUVs; 1.74 ± 0.50 (SD)) [16], the uptake varies across individual tumors. Further study of the use of these imaging modalities for the differentiation between benign leiomyoma and leiomyosarcoma is needed.

In addition, one of the reasons for the difficult diagnosis in our case was that this tumor was a pedunculated subserous tumor. Various juxta-uterine masses, including subserosal myomas, adnexal masses, bowel mass, and the differentiation among them is often difficult [17]. Kim et al. [18] describe that the demonstration of feeding vessels on

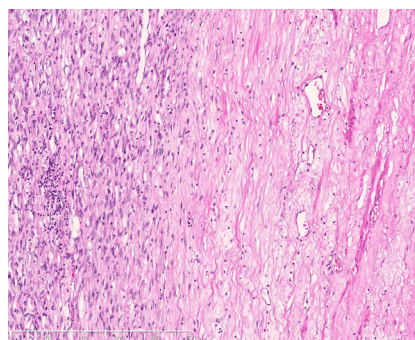


Figure 10: Histological findings of a uterine leiomyosarcoma.

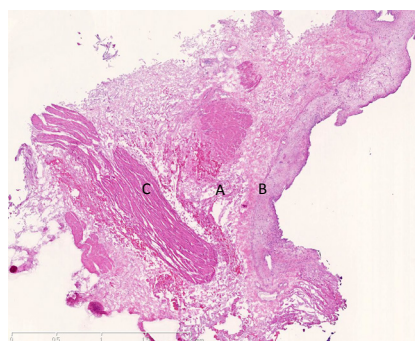


Figure 11: Histological assessment of surgical sample. A) Fat tissue B) Intervenes between the tumor and C) the bladder.

| | Year | Ref No. | Age | Diameter | Preop diag | Mitoses | Surgery | Adjuvant therapy | Status |
|---------------------------------------|------|---------|-----|----------|----------------|-------------|---------------------|------------------|----------------|
| Broad ligament leiomyosarcoma | | | | | | | | | |
| Lowel & Karsh | 1968 | 20 | 50 | 11 | NA | 0-4/HPF | TAH+BSO | - | NED>12 months |
| Ullman & Roumell | 1973 | 21 | 50 | 11 | NA | NA | TAH+BSO | NA | NA |
| Weed & Podger | 1976 | 22 | 50 | 11 | NA | NA | TAH+BSO | - | DOD 19 months |
| DiDomenico et al. | 1982 | 23 | 48 | 11 | NA | 10.5/10HPF | TAH+BSO | - | NED>21 months |
| Raj-Kumar | 1982 | 24 | 70 | 10 | NA | <10/HPF | Resection | - | NED>24 months |
| Herbold et al. | 1983 | 25 | 73 | 15 | NA | 21/10HPF | TAH+BSO | - | DOD 1 month |
| Shimm & McDonough | 1987 | 26 | 31 | 9 | NA | 8/10HPF | Resection | RT | AWD 30 months |
| Lee et al. | 1991 | 27 | 36 | 35 | ovarian cancer | >10/10HPF | TAH+BSO | CT | AWD >33 months |
| Lee et al. | 1991 | 27 | 65 | 16.4 | fibroid | >10/10HPF | STH+BSO | CT | AWD >26 months |
| Cheng et al. | 1995 | 28 | 59 | 7 | NA | >10/10HPF | TAH+BSO | - | NED>12 months |
| Pekin et al. | 2000 | 29 | 56 | 11 | ovarian tumor | 14/10HPF | TAH+BSO | - | NED>25 months |
| Agarwal et al. | 2003 | 30 | 55 | 14 | NA | >10 | TAH+BSO | CT | NED>12 months |
| Shah et al. | 2003 | 31 | 87 | 20 | ovarian cancer | 30-40/10HPF | TAH+BSO+OM | - | DOD 2M |
| Kir et. | 2003 | 32 | 35 | 17 | NA | 15-20/10HPF | TAH+BSO+PLN | - | NA |
| El-Idrissi & Fadli | 2004 | 33 | 52 | 12.5 | NA | NA | TAH+BSO | - | DOD 3 months |
| Murialdo et al. | 2005 | 34 | 53 | 12 | uterine tumor | <10/10HPF | TAH+BSO+OM | - | NED 13 months |
| Ben Amara et al. | 2005 | 35 | 49 | 23 | ovarian cancer | 7/10HPF | TAH+BSO+OM+appe | - | DOD 5 months |
| Falconi et al. | 2006 | 36 | 52 | NA | NA | NA | TAH+BSO | NA | AWD 117 months |
| Papachatzopoulos et al. | 2009 | 37 | 38 | 20 | fibroid | >10/10HPF | TAH+BSO | - | DOD 8 months |
| Duhan et al. | 2009 | 38 | 45 | 24 | NA | >10/10HPF | Resection+BSO | CT | NED>15 months |
| Kolusari et al. | 2009 | 39 | 35 | 18 | pelvic mass | >20/10HPF | TAH+BSO+OM+PLN+PAND | CT+RT | NED>12 months |
| Round ligament leiomyosarcoma | | | | | | | | | |
| Kirkham et al. | 2008 | 40 | 47 | 5 | inguinal mass | NA | TAH | pre op RT | NED>12 months |
| Subserous pedunculated leiomyosarcoma | | | | | | | | | |
| Younis et al. | 1990 | 41 | 30 | 8 | NA | 8/10HPF | Resection | - | NED>36 months |
| Ohara & Teramoto | 2000 | 42 | 50 | 12 | ov cancer | NA | TAH+BSO | - | NA |
| Vellanki VS | 2010 | 43 | 40 | 18 | | >4/HPF | TAH+BSO | - | NA |
| Our case | 2008 | | 49 | 30 | ov cancer | >10/10HPF | TAH+BSO+OM | - | NED>51 months |
| Our case | 2012 | | 58 | 23 | ov cancer | >10/10HPF | TAH+BSO | - | NED>4 months |

Ref: Reference; NA: Not Applicable; TAH: Total Abdominal Hysterectomy; BSO: Bilateral Salpingo-Oophorectomy; OM: Omentectomy; PLN: Pelvic Lymphadenectomy; PAND: Paraaortic Lymphnode Dissection; CT: Chemotherapy; RT: Radiotherapy; NED: No Evidence of Disease, DOD: Dead Of Disease; AWD: Alive With Disease

Table 1: The cases of leiomyosarcoma in an unusual location.

imaging studies may be helpful in the differentiation of subserosal myomas from other juxta-uterine pelvic masses. The sensitivity/specificity of this finding in differentiating subserosal myomas and extrauterine tumors was 100/92%, 91/91%, and 95/89%, respectively, with Color or Power Doppler US (CDUS/PDUS), MRI, and either CDUS/PDUS or MRI. Lee et al. prospectively evaluated the “ovarian vascular pedicle” sign as a way of differentiating ovarian from subserosal uterine lesions on single-detector helical CT [19]. When the ovarian vascular pedicle sign on helical CT confirmed the ovarian origin, the sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy were 92% (99/108), 87% (20/23), 97% (99/102), 69% (20/29), and 91% (119/131), respectively. In our two cases, we could not diagnose the origin of the tumor correctly because the huge cystic degeneration resembled an ovarian cancer and it is impossible to detect feeding vessels with MRI and CT. Table 1 shows the cases of leiomyosarcoma in an unusual location. Most reports do not describe the preoperative diagnosis. Among the 12 cases for which a preoperative diagnosis was made, no case was diagnosed correctly as leiomyosarcoma. This fact indicates the difficulty for the preoperative diagnosis of leiomyosarcoma in unusual locations. Due to the paucity of available literature on pedunculated subserous leiomyosarcoma, their long-term prognosis and biological behavior is not properly known.

In summary, two rare cases of pedunculated subserous leiomyosarcomas in premenopausal woman have been presented. Review of the English literature between 1950 and 2013 in Medline

revealed only three such cases have been reported in the past. Signs and symptoms of pedunculated uterine tumor are non-specific, and therefore the definitive diagnosis is usually established postoperatively. Due to the limited number of case reports, additional experiences will be necessary to determine what kind of the imaging features can allow a confident preoperative diagnosis of uterine leiomyosarcoma.

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