CD34-positive uterine lipoleiomyoma in a postmenopausal woman with chronic glomerulonephritis

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Summary

Lipoleiomyomas are rare benign mesenchymal tumors in the uterus that are composed of an admixture of smooth muscle and adipose tissue. Their pathogenesis is still controversial, although many theories have been proposed so far. Herein, the authors report the first case of a CD-34 positive lipoleiomyoma in a patient with chronic glomerulonephritis. A 60-year-old postmenopausal woman with chronic glomerulonephritis and hyperlipidemia underwent a screening ultrasonographic examination, and a mass located on the left side of the uterus was detected. She underwent hysterectomy and bilateral salpingo-oophorectomy. Pathologically, the tumor was composed of an admixture of smooth muscle cells and mature adipocytes. The diagnosis of lipoleiomyoma was made. Immunohistochemically, some smooth muscle cells in the tumor were positive for CD34, which is one of the mesenchymal stem cell markers. The significance of CD34 positivity remains obscure. Further studies are needed to clarify the role of CD34-positive cells in the pathogenesis of lipoleiomyomas.

Key words: CD34; Chronic glomerulonephritis; Lipoleiomyoma; Uterus.

Introduction

Uterine lipoleiomyomas are rare benign mesenchymal tumors mainly arising in the myometrium or subserosa [1, 2], with an incidence rate ranging from 0.03% to 2.9% among uterine myomatous tumors [1-6]. Although conventional leiomyomas are usually found in women in the reproductive period, lipoleiomyomas mostly arise in peri- or postmenopausal women [1-3]. Lipoleiomyomas are mainly found in the uterine corpus, but may be found in other locations including the uterine cervix, ovary, broad ligament, and retroperitoneum [1, 2, 5, 6].

Uterine lipoleiomyomas may be associated with hyperlipidemia, hypothyroidism, and diabetes mellitus [1, 2, 6-8]. The pathogenesis of uterine lipoleiomyomas is still obscure. However, changes in lipid metabolism related to estrogen deficiency in the peri- or postmenopausal period may play an important role in the development of lipoleiomyomas [1, 2, 6, 7]. The present authors encountered a case of a CD34-positive uterine lipoleiomyoma in a postmenopausal woman with chronic glomerulonephritis. To their knowledge, this is the first reported case of lipoleiomyoma either as a CD34-positive tumor or as a tumor arising in a patient with chronic glomerulonephritis.

Case Report

A 60-year-old, gravid 2, para 2, postmenopausal woman underwent a screening ultrasonographic examination that detected a homogeneous high echoic mass located on the left side of the uterus. She experienced menopause at the age of 56. She had hypertension, hyperlipidemia, and chronic glomerulonephritis, which was clinically diagnosed as IgA nephritis, with resulting proteinuria (1-3 g/gCr). At the age of 51, renal biopsy was performed, but significant findings were not obtained. After the ultrasonographic examination, she consulted the Department of Obstetrics and Gynecology of Kyorin University Hospital. Magnetic resonance imaging was performed, and both T1- and T2-weighted images showed a mass with moderate-to-high signal intensity. Fat-suppressed T1-weighted images disclosed suppression of the signal intensity, so the tumor was thought to contain fat components. A steroid cell tumor of the left ovary was suspected, and hysterectomy and bilateral salpingo-oophorectomy were performed.

Grossly, a subserosal mass measuring 60×43×33 mm was recognized on the left wall of the uterus. The tumor was well circumscribed, with a homogeneous yellow to white appearance (Figure 1).

Microscopically, the tumor was composed of an admixture of spindle-shaped smooth muscle cells and mature adipocytes (Figure 2). Smooth muscle cells showed a fascicular pattern. There were few mitotic figures, and necrosis was not recognized. The tumor had small blood vessels, but did not contain abnormal tortuous vessels and perivascular epithelioid cells, which are typical findings of angiomylipoma (PEComa). A diagnosis of lipoleiomyoma was made. A coincidental conventional leiomyoma was...
Immunohistochemical findings of the lipoleiomyoma and the coincidental leiomyoma are summarized in Table 1. The smooth muscle component stained positive with desmin and smooth muscle actin (SMA) (Figure 3a), partially positive with CD34 (Figure 3b), and negative with melanocytic markers (S100, HMB-45, and MART-1), which are also expressed in angiomyolipomas. The adipose component stained positive with S100. In addition, most of the smooth muscle cells were positive for estrogen receptor (ER), and some were also positive for progesterone receptor (PgR). Signal transducer and activator of transcription-6 (STAT6) expression was weakly positive only in the cytoplasm of the smooth muscle cells. The patient was discharged eight days after operation, and there has been no recurrence for 12 months.

Discussion

Uterine lipoleiomyomas are rare mesenchymal tumors that may be associated with metabolic disorders including hyperlipidemia, hypothyroidism, and diabetes mellitus [1, 2, 6-8]. In the present case, the patient was a postmenopausal woman with hyperlipidemia. She also had chronic glomerulonephritis, which induced prolonged proteinuria (1-3 g/gCr). Although the measured levels of serum albumin and proteinuria did not fulfill the criteria for nephrotic syndrome, protein loss induced by chronic glomerulonephritis was thought to be associated with the hyperlipidemia. To the present authors’ knowledge, lipoleiomyomas associated with chronic glomerulonephritis have not been previously reported. Hypothyroidism is known to be associated with development of lipoleiomyomas through alterations in lipid metabolism [1, 2, 6-8]. Chronic glomerulonephritis may be another underlying condition that contributes to the development of lipoleiomyomas through hyperlipidemia.

The pathogenesis of uterine lipoleiomyomas remains controversial. Many hypotheses about the origin of the adipose tissue in lipoleiomyomas have been proposed. They include misplaced embryonic fat cells, lipocytic differentiation of multipotential undifferentiated mesenchymal cells,
CD34-positive uterine lipoleiomyoma in a postmenopausal woman with chronic glomerulonephritis

Table 1. — Immunohistochemical findings of the lipoleiomyoma and the coincidental leiomyoma of the present case.

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Lipoleiomyoma</th>
<th>Leiomyoma (coincident tumor)</th>
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<tbody>
<tr>
<td>Desmin</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>SMA</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>HHF-35</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>Caldesmon</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>CD34</td>
<td>Partially +</td>
<td>–</td>
</tr>
<tr>
<td>ST00</td>
<td>–</td>
<td>+</td>
</tr>
<tr>
<td>ER</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>PgR</td>
<td>Partially and weakly +</td>
<td>–</td>
</tr>
<tr>
<td>STAT6</td>
<td>Partially and weakly + (cytoplasm)</td>
<td>–</td>
</tr>
<tr>
<td>CD117 (c-kit)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Bcl-2</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>HMB-45</td>
<td>–</td>
<td>–</td>
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<tr>
<td>MART-1</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ki-67 labeling index</td>
<td>&lt; 1 %</td>
<td>&lt; 1 %</td>
</tr>
</tbody>
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lipomatous metaplasia of smooth muscle cells or connective tissue cells, and fat inclusion during surgery [1-8]. Some chromosomal abnormalities identical to those of conventional leiomyomas have been documented in lipoleiomyomas [9-11]. In addition, like most conventional leiomyomas, smooth muscle cells in the lipoleiomyoma of the present case were also positive for ER. Estrogen is associated with the proliferation and metabolism of uterine smooth muscle cells. As previously suggested by other authors, changes in lipid metabolism during the peri- and postmenopausal period may promote lipomatous proliferation in lipoleiomyomas [1, 2, 6-8].

CD34 is one of the markers for multipotent cells such as mesenchymal stem cells and hematopoietic progenitor cells. Some mesenchymal tumors, including solitary fibrous tumors (SFTs) and gastrointestinal stromal tumors (GISTs), also express CD34. To the present authors’ knowledge, CD34 positivity in lipoleiomyomas has never been previously reported, and the number of conventional uterine leiomyoma cases with CD34 positivity is very few. Yin et al. showed CD34 gene expression in stem/progenitor cells in leiomyomas, [12] and Blandamura et al. documented focal CD34 positivity in chondroid-like areas in a case of leiomyoma with chondroid lipoma-like areas [13]. CD34-positive cells may play an important role in the pathogenesis of lipoleiomyomas and other rare variants of leiomyomas. Further studies are needed to clarify the role of CD34-positive cells in the pathogenesis of uterine myomatous tumors.

Recently, NAB2-STAT6 fusion was demonstrated in SFTs as a genetic alteration promoting cellular proliferation [14]. The NAB2-STAT6 fusion protein accumulates in the nucleus owing to the nuclear localization signals within its NAB2 element. Immunohistochemical detection of nuclear STAT6 is helpful for the diagnosis of SFTs [15]. Like most lipoleiomyomas, including that in the present case, SFTs frequently arise in the subserosa of visceral organs. Considering these similarities to SFTs (CD34 expression and subserosal localization), the present authors examined STAT6 expression in the present lipoleiomyoma. According to the results, STAT6 was weakly expressed only in the cytoplasm of the smooth muscle cells and did not accumulate in the nucleus. Therefore, the authors considered that, at least in the present case, the genetic alteration responsible for the pathogenesis of lipoleiomyoma differs from that of SFTs.

The authors herein reported a case of a CD34-positive lipoleiomyoma in a postmenopausal woman with chronic glomerulonephritis. The significance of the CD34 positivity remains obscure. Therefore, further studies are needed to clarify the role of CD34-positive cells in the pathogenesis of lipoleiomyomas.

References

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