Intravascular leiomyosarcomas of the femoral vein are extremely rare. Our patient was initially diagnosed with a deep vein thrombosis based on ultrasonography and venography. The thrombectomy specimen consisted of typical spindle cells with variable anaplasia arranged in a fasciculating and interlacing pattern. The final diagnosis was proved to be an intravascular leiomyosarcoma confirmed by immunohistochemical studies for smooth muscle actin, desmin, vimentin, CD34 and CD68.

**Key Words:** Leiomyosarcoma; Femoral vein

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Leiomyosarcomas usually arise from the muscle layers of the uterus and gastrointestinal tract. However, they can uncommonly occur in the vascular wall. Vascular system involvement occurs most commonly in the larger veins, such as the vena cava, and rarely involves the systemic arteries.\(^1\)\(^2\) We report a case of a luminal growing intravascular leiomyosarcoma in the common femoral vein.

**CASE REPORT**

A 72-year-old man was admitted because of left leg edema, which had first developed two months prior to admission, after the patient had gone on an eleven-hour flight from Germany to Korea. This first episode was reported to have disappeared three days later, but reappeared after a spinal surgery. A luminal mass was detected in the left common femoral vein by ultrasonography and venography, and was initially thought to be a thrombus (Fig. 1). Thrombolysis was then performed, but the size of the lesion did not decrease at all. As a result, a thrombectomy was performed. The received specimens included multiple fragments of soft tissue, measuring $3.5 \times 3.0 \times 2.8$ cm in aggregate. The cut surface was tan-grayish with focal glistening.

Microscopically, the tumor showed interlacing and whoring patterns of atypical spindle cells and abundant anaplastic giant cells, and necrosis (Fig. 2B). The cells had eosinophilic cytoplasm, and the nuclei were elongated, hyperchromatic and frequently multinucleated. Mitotic figures including atypical forms outnumbered 10/10 HPF (Fig. 2A). Positive reactions for smooth muscle actin, desmin and vimentin were noted on immunohistochemistry (Fig. 3). CD34 and CD68 immunostaining results were negative. The diagnosis of intravascular leiomyosarcoma was discovered. No metastatic lesions were detected on the following PET scan. More resection of the common femoral vein was then performed. Grossly, the femoral vein was totally obstructed by a solid mass, measuring $4.0 \times 3.0 \times 1.5$ cm. The tumor showed both intraluminal growth and extravascular soft tissue extension (Fig. 4, 5). The resection margins of the proximal and distal common femoral vein were free of the tumor. The histologic and immunohistochemical findings were identical to the previous thrombectomy specimen. Postoperative radiation therapy was given, and no recurrence or metastasis has been noted.
In seven months since the operation.

**DISCUSSION**

Intravascular leiomyosarcomas are rare. Fewer than 300 cases of venous leiomyosarcoma have been reported since the first case was reported by Perl in 1871. Vascular wall involvement is most frequently seen in the inferior vena cava, saphenous vein, femoral vein, pulmonary artery, femoral artery and aorta, in descending order of frequency. Tumors of the inferior vena cava resulted in Budd-Chiari syndrome.

Intravascular leiomyosarcomas of the femoral vein are extremely rare, with fewer than 40 cases reported in the literature. The usually show combined intraluminal and extraluminal growth patterns. Thrombosis serves as a complication of intraluminal growth. The clinical manifestations of intravascular leiomyosarcomas of the femoral vein are similar to those of other locations; peripheral edema and/or local pain. In the initial clinical and radiologic evaluation, the tumor is often misdiagnosed as a deep vein thrombosis, similar to what occurred in our case. Further imaging tests are necessary to alert clinicians to danger of performing preoperative thrombectomy, which can lead to hematogenous dissemination throughout the vascular systems. Distant metastasis and local recurrence are unpredictable. The sites of distant metastasis include usually the lung and liver, and rarely the scalp.

Histologic examination of a typical leiomyosarcoma will usually reveal a fascicular growth pattern of spindle cells and merging of tumor cells with the blood vessel walls. In contrast to other leiomyosarcomas, intravascular leiomyosarcoma usually do not exhibit hemorrhage or necrosis. For distinguishing from the other spindle cell sarcomas, myogenic differentiation should

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**Fig. 1.** An obstructive intravascular mass is noted in the left common femoral vein on venography.

**Fig. 2.** (A) Histological section shows fasciculated and interlacing pattern of tumor. (B) Atypical tumor cells with abundant mitoses and multinucleation are present.
be confirmed by immunohistochemical study or electron microscopy. High mitotic activity, over 5/10 HPF equally as soft tissue counterparts, is virtually diagnostic for malignancy. The more aggressive behavior and worse prognosis associated with intravascular leiomyosarcomas, when compared to soft tissue counterparts, could be due to direct attack of the vascular system.\(^2\)

The treatment of choice is complete surgical resection of the tumor, along with the surrounding fat and lymphatics. Radiation therapy and/or adjuvant chemotherapy may be required, as well. The definitive effect of adjuvant therapy has not yet been demonstrated.\(^8\)

REFERENCES