Intravenous leiomyomatosis diagnosed by catheter-based contrast venography

Huabin He, Qun Chen

ABSTRACT

Introduction: Intravenous leiomyomatosis (IVL) is a rare histologically benign smooth muscle tumor that often originates from uterus and common iliac vein, sometimes extends to the right heart. Case Report: A rare case diagnosed in catheter-based contrast venography with a pathological finding is described, together with a comparative analysis of all the previous published cases. Conclusion: Intravenous leiomyomatosis has some distinctive features on catheter-based contrast venography. The imaging technique can better detect the intravenous leiomyomatosis consecutive from uterus. Based on the result of the study, it is recommend that catheter-based contrast venography should be considered as an investigative tool in the presence of cardiac or inferior vena cava tumor.

Keywords: Intravenous leiomyomatosis, Catheterization, Contrast venography, Angiography images and videos

INTRODUCTION

Intravenous leiomyomatosis (IVL) is a rare histologically benign smooth muscle tumor that usually affects premenopausal women. Fewer than 100 cases of intracardiac leiomyomatosis have been described so far in literature [1]. Its cardiac extension is often overlooked or misdiagnosed because of its low morbidity. The imaging appearance of IVL is non-specific, but the major role of imaging examination is to define the extent of the lesion [2]. Therefore, it is necessary to find a more sensitive diagnostic method for IVL.

Herein, we report our experience with the use of catheter-based contrast venography in a patient with suspected IVL to directly determine its characteristics, the extent of the lesion.

CASE REPORT

A 44-year-old female was admitted to our department with a five-day history of mild to moderate acute pain and edema of the left lower extremity. Total abdominal and pelvic ultrasound demonstrated a left-sided abnormal uterine adnexal tumor and an intrauterine device (IUD) before admission. She had no relevant past medical history. Physical examination demonstrated a regular sinus rhythm with heart rate 82 beats/min and a grade 3/6 systolic murmur was heard at the apical region. Laboratory findings were generally non-specific. Deep vein thrombosis (DVT) was suspected on the basis of clinical practice.
During peripheral vascular catheterization, a 5F pigtail catheter was introduced through the common femoral vein to perform angiography in different parts of the body, which showed a dilated left iliac vein containing a mass extending into the right heart chambers. Pelvic angiogram revealed the left common iliac vein was mildly dilated and obstructed by the mass compared to the right common iliac vein (Figure 1). Images showed an elongated mass (150.03×16.24 mm) in the lumen of the IVC extending from inferior vena cava (IVC) to the right atrium (Figure 2). When the catheter was shown passing through superior vena cava, intracardiac angiography demonstrated a mobile oval-shaped mass (62.50×35.85 mm) in the right atrium (Figure 3). The tumor of IVC was dissected and isolated under low temperature and cardiopulmonary bypass through partial sternotomy and median laparotomy. Uterus had not been touched. The removed mass was smooth and encapsulated. Pathology, subsequently, warranted the diagnosis of intravenous leiomyomatosis of the IVC (Figure 4). The histopathology examination reported proliferation of smooth muscle bundles without any atypical cellular signs excluding leiomyosarcoma and angiomyolipoma. After 12 months from the surgery, there was no recurrence of intravenous leiomyomatosis.

**DISCUSSION**

The procedure in our case was performed in catheter-based contrast venography, which had not been reported in previous literature. Angiographic images can provide important information unavailable by other imaging techniques because of its superb-quality intravascular digital subtraction angiography (DSA) images and video, direct multi-angle imaging capability and unique ability to assess intraluminal filling defect by the direct injection of contrast agents in various lesions. Moreover, for some patients with deep vein thrombosis, catheter-based contrast venography plays a therapeutic role by the direct injection of anti-thrombotic drugs.

Radiologically, the differential diagnosis of IVL mainly includes malignant tumor and atrial myxoma. All the tumor emboli of the malignant tumors from kidney and liver have the same imaging features as the primary tumors and are often directly connected with them [3]. The majority of atrial myxomas are found in the left
atrium, and the right atrium is a less common site [4]. The right atrial myxoma has a pedicle attached to the wall of the atrium and generally does not spread to the IVC. Although tumors involving IVC and right atrium have their own imaging features different from those seen on IVL with cardiac extension, the final diagnosis depends on histopathology.

**CONCLUSION**

In conclusion, an early diagnosis of intravenous leiomyomatosis relies on a high index of suspicion. Intravenous leiomyomatosis has some distinctive features on catheter-based contrast venography, which can clearly show characteristics of the tumor, the path of extension, and anti-thrombotic therapy. All of these are very important to the diagnosis, surgical operation plan, prognosis, and the follow-up of tumor. Catheter-based contrast venography could have unique advantages for diagnosing intravenous leiomyomatosis. With our experience, the imaging technique can better detect the intravenous leiomyomatosis consecutive from uterus. Based on the result of the study, it is recommend that catheter-based contrast venography should be considered as an investigative tool in the presence of cardiac or inferior vena cava tumor.

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**Author Contributions**

Huabin He – Substantial contributions to conception and design, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Qun Chen – Acquisition of data, Revising it critically for important intellectual content, Final approval of the version to be published

**Guarantor**

The corresponding author is the guarantor of submission.

**Conflict of Interest**

Authors declare no conflict of interest.

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