Radiology Case Reports 16 (2021) 1233–1236

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Intravascular lipoma of the inferior vena cava and left renal vein ☆,☆☆,★

Hirofumi Koike, MD, Miyakawa Suzuka, MD, Minoru Morikawa, MD, Eijyun Sueyoshi, MD, Masataka Uetani, MD*

Department of Radiological Sciences, Nagasaki University Graduate School of Biomedical Sciences, 1-7-1 Sakamoto, Nagasaki 852-8501, Japan

ARTICLE INFO

Article history:
Received 20 February 2021
Accepted 27 February 2021

Keywords:
Intravascular lipoma
CT
MRI

ABSTRACT

Intravenous lipoma of the inferior vena cava is an incidental finding on contrast-enhanced computed tomography in 0.5% of individuals. We report a case of multiple intravenous lipomas discovered during diagnosis of cholangitis in a 39-year-old woman. Imaging revealed three fatty masses that appeared connected by cordlike structures: one in the left renal vein with wide mural attachment and two in the inferior vena cava, the higher of which was mobile. We hypothesize that these originated as a single lipoma that subsequently divided into three distinct masses. Because mobile masses may cause pulmonary thromboembolism, surgery is recommended in these cases.

Introduction

Lipomas of the major central veins are rare. The most common location for these tumors is the inferior vena cava (IVC), where they are found in approximately 0.5% of the general population on contrast-enhanced computed tomography (CECT) [1]. Venous lipomas have been less frequently reported in the superior vena cava (SVC), innominate vein, subclavian vein, internal jugular vein, external iliac vein, and common femoral vein [2–10]. Only one case of intravascular lipoma of the right renal vein with extension to the IVC has been reported [11]. To our knowledge, there are no previous reports of multiple isolated lipomas of the IVC and left renal vein.

Case report

A 39-year-old Japanese woman presented to a local hospital with recurrent chest and back pain and refractory nausea and vomiting of 1 week's duration. Her medical history included pervasive developmental disorder; her family history was unremarkable. The patient underwent CECT, which revealed two

☆ Financial disclosure: None.
☆☆ Declaration of Competing Interest: None.
★ Acknowledgment: We thank Rebecca Tollefson, DVM, from Edanz Group (https://en-author-services.edanzgroup.com/ac) for editing a draft of this manuscript and helping to draft the abstract.

* Corresponding author.
E-mail address: kei16231623@gmail.com (H. Koike).

https://doi.org/10.1016/j.radcr.2021.02.070

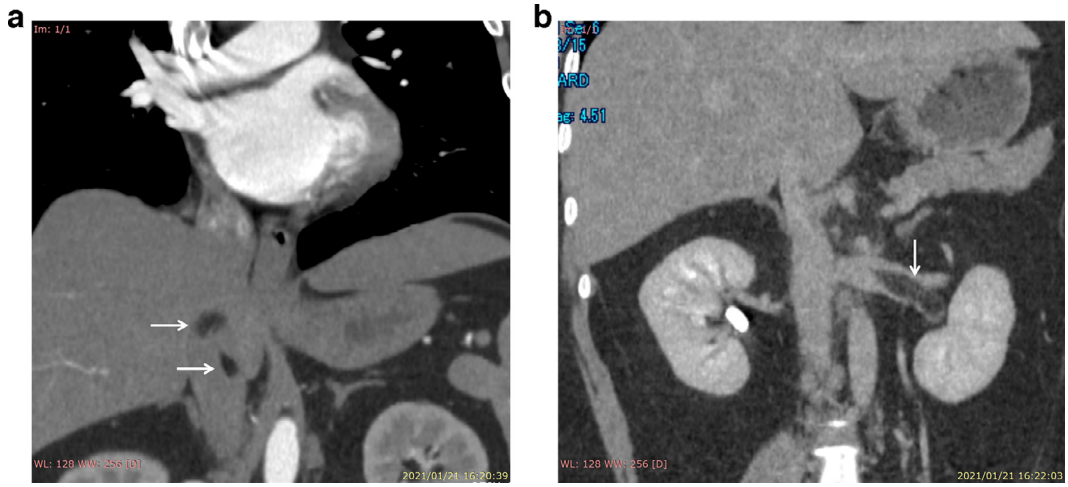

Fig. 1 – Contrast-enhanced computed tomography images obtained before referral to our hospital. Coronal images (a, b) show well-circumscribed homogeneous fat-attenuating masses in the IVC and left renal vein (white arrows).

nonenhancing masses (15 × 8 mm and 6 × 5 mm) in the IVC and one nonenhancing mass (39 × 12 mm) in the left renal vein (Fig. 1). These masses were within the vein lumen; the mass in the left renal vein was widely connected with the wall. All three masses showed homogeneous fatty tissue attenuation consistent with fat embolism. Although no evidence of pulmonary embolism was found, the patient was referred to our hospital because of the potential risk.

On admission at our hospital, the patient's temperature was 36.8°C; she had no fever during hospitalization. Her pulse was regular at 75 beats/min and her blood pressure was 130/90 mm Hg. The patient's weight was 91.6 kg (body mass index 39.6 kg/m^2). Cardiovascular and respiratory examinations were unremarkable. No edema was evident in her lower extremities. Her oxygen saturation level was 98% in room air. She had no jaundice or pain on abdominal palpation. Echocardiogram and electrocardiogram showed no evidence of cardiac failure or pulmonary hypertension. Abdominal ultrasound showed debris within the gallbladder but no marked dilation of the gallbladder or bile ducts or abnormality of the pancreas.

Laboratory analysis revealed C-reactive protein at 1.29 mg/dL (normal: ≤ 0.1 mg/dL), aspartate aminotransferase at 214 IU/L (normal: 7-38 IU/L), alanine aminotransferase at 291 IU/L (normal: 4-44 IU/L), gamma-glutamyltranspeptidase at 271 U/L (normal: 10-40 U/L), total bilirubin at 2.4 mg/dL (normal: 0.2-1.2 mg/dL), direct bilirubin at 1.8 mg/dL (normal: 0.1-0.4 mg/dL), total cholesterol at 208 mg/dL (normal: 130-220 mg/dL), triglycerides at 49 mg/dL (normal: 50-149 mg/dL), high-density lipoprotein at 32 mg/dL (normal: 40-70 mg/dL), and low-density lipoprotein at 166 mg/dL (normal: 70-139 mg/dL).

Although the patient began fasting at admission, she continued to have intermittent chest and back pain. Her pain and nausea increased on the day after admission. Laboratory testing revealed worsening liver dysfunction. Therefore, the patient underwent endoscopic ultrasound, which revealed small stones in the distal common bile duct. The cause of chest and back pain was thought to be cholangitis resulting from passage of debris from the gallbladder. After insertion of a bile duct tube, the patient's chest and back pain resolved and her hepatic dysfunction improved. The patient had no symptoms and was discharged home.

Magnetic resonance imaging (MRI) was performed 25 days after the first CECT to confirm the nature of the intravascular masses (Fig. 2). The masses were of high signal intensity on T1-weighted and T2-weigted images; they showed uniform signal drop on fat-suppressed sequences. Therefore, they were considered lipomas. The upper mass in the IVC moved between capture of T1-weighted and T2-weighted images. Cine-mode MRI also revealed movement of the upper IVC mass. The two IVC masses seemed to be connected by a cordlike structure. There was no clear connection between the lower IVC mass and the mass in the left renal vein, but each seemed to have an attached cordlike structure. Because mobility of the lipoma in the IVC created the risk of future pulmonary thromboembolism, surgical excision was recommended. However, the patient refused surgery. The lipomas will be monitored with CT and ultrasound.

Written informed consent was obtained from the patient for publication of this case report. This study received approval by my institutional review board approval.

Discussion

Intravascular lipomas are rare primary venous tumors occurring most commonly in the IVC, with a frequency of 0.35% to 0.5% on all CT scans [12]. A review of the current literature identified isolated case reports of intravascular lipomas of the SVC [3,7,8], subclavian vein [2], innominate vein [6], internal jugular vein [9,10], femoral vein [4,5], and renal vein [11]. In our patient, two lipomas were present in the IVC and one in the left renal vein. In addition, one of the masses in the IVC was mobile. Previous reports of intravascular lipoma have not described multiple masses in a single patient, and it is

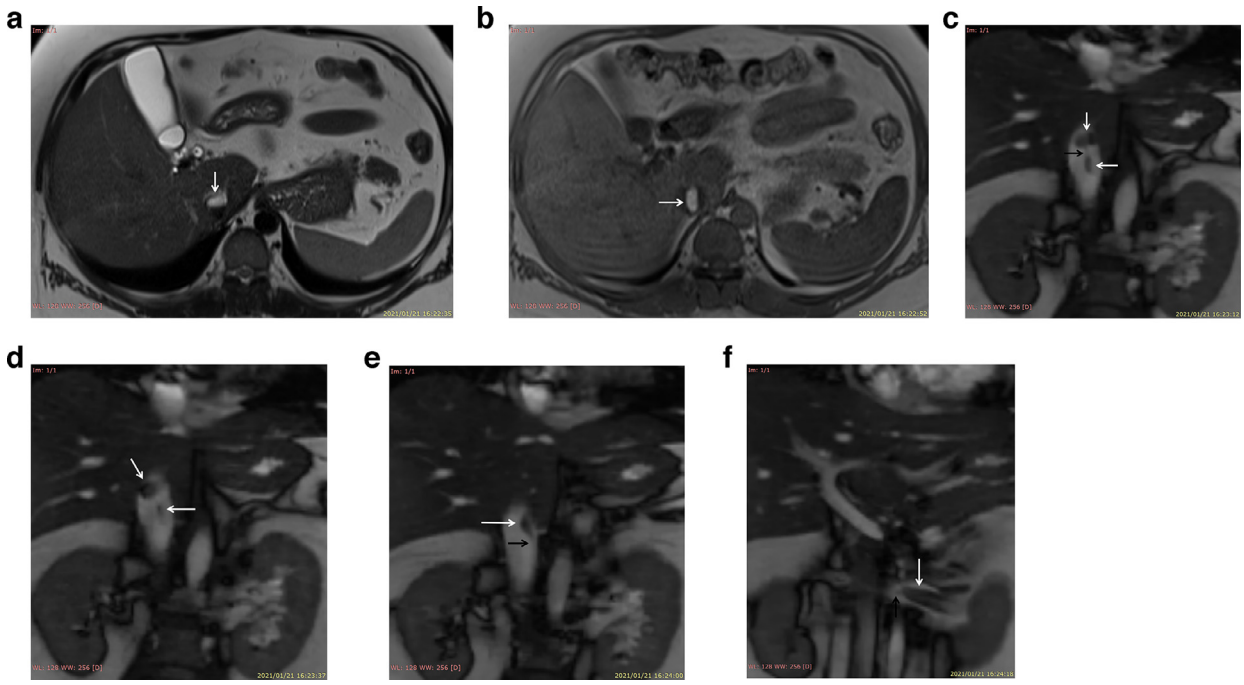

Fig. 2 – Magnetic resonance (MR) images obtained 25 days after initial contrast-enhanced computed tomography. Axial T2 MR image (a) **demonstrates homogeneous hyperintense oval mass in the IVC (white arrow). Axial T1 MR image** (b) **demonstrates homogeneous hyperintense oval mass in the IVC (white arrow). However, the mass has moved from its position when the axial T2 image was taken. Cine-mode coronal MR images** (c, d) **show movement of the upper IVC mass (white arrows). The two IVC masses appear connected to one another by a cordlike structure (black arrow). Cine-mode coronal MR images** (e, f) **show cordlike structures (black arrows) attached to the lower IVC mass and the left renal vein mass (white arrows).**

difficult to explain the relationship among the three lipomas. There have been no reports of a single intravenous lipoma separating into two masses. However, in reports of intravascular lipoma treated with surgical resection, the tumors arose from the venous wall and were soft [7, 9]. Therefore, because the mass in the left renal vein was large enough to fill the lumen and was in close contact with the wall, we suspect that this mass arose from the wall of the left renal vein and that part of it separated and moved to the IVC. The two IVC masses were smaller than the mass in the left renal vein, and the upper mass was very mobile. The two masses in the IVC seemed to be connected to each other by a cordlike structure. There was no clear connection between the lower mass in the IVC and the mass in the left renal vein; however, each mass seemed to have an attached cordlike structure.

Usually surgical excision of an intravascular lipoma is indicated only when patients are symptomatic. These tumors are most often asymptomatic, but they can rarely cause venous obstructive symptoms, such as SVC syndrome [3]. One reported patient developed a thrombotic complication because the occlusive effects of a lipoma prevented adequate venous return. Two other patients underwent surgery despite a lack of symptoms to prevent potential obstructive and thromboembolic complications and to obtain a definitive histological diagnosis to rule out malignancy [7,9]. To our knowledge, there are no previous reports of multiple or mobile intravenous lipomas. We recommend surgical intervention to reduce the risk of pulmonary embolism when intravenous lipoma is separated and mobile.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2021.02.070.

REFERENCES

[1] Miyake H, Suzuki K, Ueda S, Yamada Y, Takeda H, Mori H. Localized fat collection adjacent to the intrahepatic portion of inferior vena cava: a normal variant on CT. Am J Roentgenol 1992;158:423–5.
[2] Lomeo A, D'Arrigo G, Scolaro A, Mudanò M, Monea MC, Mauceri G, et al. A case of intra and extra-vascular lipoma of the subclavian vein. EJVES Extra 2007;13:37–9.
[3] Bravi MC, Salvadei S, Scarponi P, Loforte A, Musumeci F, Gasbarrone L. Intravascular lipoma of the superior vena cava. Intern Emerg Med 2012;7:79–81.
[4] Martín-Pedrosa JM, del Blanco I, Carrera S, González-Fajardo JA, Gutiérrez V, Vaquero C. Intravascular lipoma of the external iliac vein and common femoral vein. Eur J Vasc Endovasc Surg 2002;23:470–2.
[5] Mcclure MJ, Sarrazin J, Kapusta L, Murphy J, Arenson AM, Geerts W. Intravascular femoral vein lipoma: an unusual

cause of lower limb venous obstruction. Am J Roentgenol 2001;176:463–7.
[6] Moore FO, Norwood SH. Intravascular lipoma of the right innominate vein in a trauma patient. J Am Coll Surg 2008;207:139.
[7] Mordant P, Mercier O, Fadel E, Muniappan A, Fabre D, Chataigner O, et al. Surgical resection of an intravascular superior vena cava primary lipoma. J Thorac Cardiovasc Surg 2010;140:1437–8.
[8] Thorogood SV, Maskell GF. Case report: intravascular lipoma of the superior vena cava–CT and MRI appearances. Br J Radiol 1996;69:963–4.
[9] Yoon RH, Buzas CJ, Garvin RP, Franklin DP. Intravascular lipoma of the internal jugular vein. J Vasc Surg Venous Lymphat Disord 2013;1:406–8.
[10] Vetrhus M, Fjetland L. Intravenous lipoma. Tidsskr Nor Laegeforen 2017;137:22 (In Norwegian).
[11] Doyle Z, Wolford B, Morshedi MM, Santillan CS. Intravascular lipoma of the renal vein. BJR Case Rep 2015;1:20150072.
[12] Perry JN, Williams MP, Dubbins PA, Farrow R. Lipomata of the inferior vena cava: a normal variant? Clin Radiol 1994;49:341–2.