JACC: CASE REPORTS VOL. 2, NO. 10, 2020

MINI-FOCUS ISSUE: IMAGING

ADVANCED

IMAGING VIGNETTE: CLINICAL VIGNETTE

Invasive Cardiac Lipoma Complicating Visceral Inversion

Takahide Kadosaka, MD,[a] Shingo Tsujinaga, MD, PHD,[a] Hiroyuki Iwano, MD, PHD,[a] Noriko Oyama-Manabe, MD, PHD,[b] Toshihisa Anzai, MD, PHD[a]

ABSTRACT

We report a case of cardiac lipoma with intramyocardial invasion complicated by visceral inversion, which, to the best of our knowledge, has not been reported before. Multimodality imaging played an important role in differential diagnosis and determination of the management strategy. (**Level of Difficulty: Advanced.**) (J Am Coll Cardiol Case Rep 2020;2:1570–1)

A 63-year-old asymptomatic woman with visceral inversion, rheumatoid arthritis, and scleroderma treated with prednisolone 9 mg/day and methotrexate 16 mg/week was admitted for management of an intracardiac mass incidentally found on computed tomography (CT). Although visceral inversion was detected on CT when the patient was in her thirties, the intracardiac mass was not identified at the time. On admission, her blood pressure was 124/75 mm Hg and pulse rate 88 beats/min. Clinical examination revealed no heart murmur. CT revealed a 3-cm low-density mass with mean CT value of -40 HU in the apical anterior wall of the left ventricle; it infiltrated the muscle layer and showed no contrast enhancement (**Figure 1A**). Echocardiography revealed protrusion of a slightly mobile mass into the left ventricular (LV) cavity (Video 1). Although thrombosis after myocardial infarction must be considered for a mass in the LV apex, LV wall motion did not suggest myocardial infarction. 18F-fluoro-deoxyglucose positron emission tomography-CT showed no significant focal uptake in the mass (**Figure 1B**), suggesting low probability of malignancy. Cardiac magnetic resonance imaging (MRI) showed a high intensity on T1- and T2-weighted images with fat suppression without contrast enhancement (**Figure 1C to 1F**, Videos 2 and 3). Based on these findings, benign cardiac lipoma was suspected. Owing to the high surgical risk for histological diagnosis and absence of tumor-related symptoms, careful follow-up was planned. Follow-up CT after 6 months showed no change in the size of the mass and no tumor-associated symptoms on follow-up for 9 months.

Cardiac lipomas represent 8.4% of primary cardiac tumors (1), most commonly originating in the subendocardium (50%), followed by the myocardium (25%) and subepicardium (25%); typical locations include the right atrium and the left ventricle (1). The degree of symptoms depends on the location and size of the tumors. Notably, cardiac lipoma complicating visceral inversion has never been reported. Visceral inversion is associated with genetic mechanisms but not with the development of cardiac tumors (2). Despite reports of concurrent development of visceral inversion and digestive system neoplasms, the presence of cardiac lipoma and visceral inversion could be incidental. Accordingly, the clinical manifestation of this case is rare.

From the [a]Department of Cardiovascular Medicine, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Sapporo, Japan; and the [b]Department of Radiology, Saitama Medical Center, Jichi Medical University, Omiya, Japan. All authors have reported that they have no relationships relevant to the contents of this paper to disclose.
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC: Case Reports* author instructions page.

Manuscript received March 18, 2020; revised manuscript received May 13, 2020, accepted May 26, 2020.

ISSN 2666-0849 https://doi.org/10.1016/j.jaccas.2020.05.061

Recent advances in cardiac imaging have enabled accurate diagnosis of cardiac tumors (3) although it must be confirmed based on pathological findings. Surgical resection is the standard management of benign cardiac tumors to relieve tumor-associated symptoms or reduce the risk of embolic events. However, management of asymptomatic patients as in this case remains unstandardized and is based on the risk of invasive strategy. In LV lipomas with invasion into the myocardium, surgical resection is unsafe owing to surgical complications such as intraoperative cardiac rupture, coronary artery injury, and postoperative lethal arrhythmias (3). Our case was complicated with connective tissue disease requiring immunosuppressive therapy, which also increased the perioperative risk of complications, resulting in careful follow-up without surgical resection.

In conclusion, we report the first case of cardiac lipoma with intramyocardial invasion complicating visceral inversion. Multiple imaging enabled noninvasive differential diagnosis and management of the cardiac tumor.

ABBREVIATIONS AND ACRONYMS

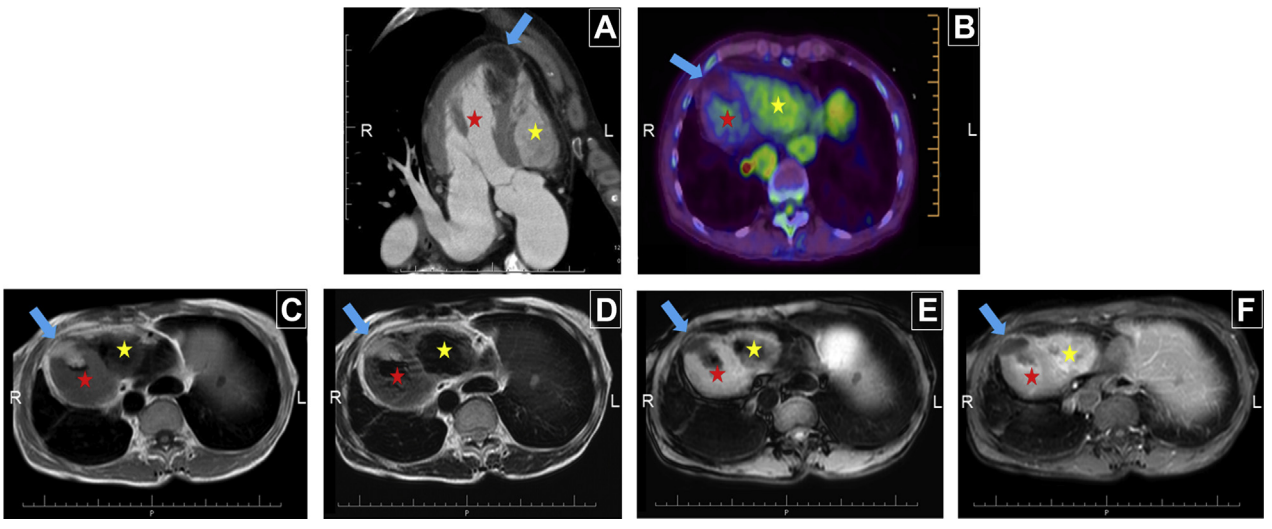
CT = computed tomography

LV = left ventricular

MRI = magnetic resonance imaging

ADDRESS FOR CORRESPONDENCE: Dr. Shingo Tsujinaga, Department of Cardiovascular Medicine, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Kita-15, Nishi-7, Kita-ku, Sapporo 060-8638, Japan. E-mail: shingo-t.0207@med.hokudai.ac.jp.

FIGURE 1 Multimodality Imaging of Invasive Cardiac Lipoma Complicating Visceral Inversion



The **red star** shows the left ventricle, whereas the **yellow star** shows the right ventricle. **(A)** Contrast-enhanced CT demonstrates a 29 × 27 mm low-density mass (mean CT value of -40 HU) in the anterior wall of the apical left ventricle **(A, light blue arrow)**, which shows no contrast enhancement. The anatomy indicates visceral inversion. **(B)** 18F-fluoro-deoxyglucose positron emission tomography–CT shows no focal uptake in the intracardiac mass **(B, light blue arrow)**. **(C and D)** Cardiac MRI shows a high intensity in the mass on both of T1WI **(C, light blue arrow)** and T2WI **(D, light blue arrow)**. **(E)** The high intensity of the mass was suppressed in the fat-suppressed T1WI **(E, light blue arrow)**. **(F)** Gadolinium-enhanced T1WI shows no contrast effect in the mass **(F, light blue arrow)**. CT = computed tomography; MRI = magnetic resonance imaging; T1W1 = T1-weighted image.

REFERENCES

1. D'Souza J, Shah R, Abbass A, Burt JR, Goud A, Dahagam C. Invasive cardiac lipoma: a case report and review of literature. BMC Cardiovasc Disord 2017;17:28.

2. Peeters H, Devriendt K. Human laterality disorders. Eur J Med Genet 2006;49:349–62.

3. Sun X, Liu G, Kim H, Sun W. Left ventricular lipoma resected using thoracoscope-assisted limited sternotomy: a case report and literature review. Medicine (Baltimore) 2018;97:e11436.

KEY WORDS cardiac lipoma, intramyocardial left ventricular lipoma, visceral inversion

APPENDIX For supplemental videos, please see the online version of this paper.