Case Report

A rare case of left hepatic vein anomalous drainage to the coronary sinus✩✩✩

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ABSTRACT

The left hepatic vein (LHV) anomalous drainage into the coronary sinus (CS) is an extremely rare congenital vascular abnormality. It is usually asymptomatic, but it has surgical implications if the patient undergoes cardiac, vascular or hepatic procedures. We report a case of a 90-year-old man who had an isolated LHV anomalous drainage diagnosed on a computed tomography performed to evaluate fatigue. The diagnosis of LHV drainage into the CS during preoperative evaluation can avoid intraoperative complications and may determine the preferred surgical approach.

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Introduction

The left hepatic vein (LHV) anomalous drainage into the coronary sinus (CS) is an extremely rare congenital abnormality involving the CS [1]. It is characterized by a single vessel that arises from the left hepatic lobe and passes through the diaphragm to drain directly into the CS in the right atrium [2]. Most cases are incidentally diagnosed by imaging exams or during surgery and their incidence are limited to case reports. The patients are usually asymptomatic, but have surgical implications if the patient is undergoing cardiac, vascular, or hepatic procedures [3]. The objectives of this study are to describe a case of LHV anomalous drainage into the CS as a solitary cardiovascular malformation and to review the current literature.

Case Report

A 90-year-old man was admitted in the emergency room with fatigue that started 5 days before his admission. He was previ-
Table 1 – Summary of cases of isolated LHV anomalous drainage into the coronary sinus described in the literature.

| Author, Year | Gender | Age (years) | Diagnostic method | Clinical or surgical implications |
|-------------|--------|-------------|-------------------|----------------------------------|
| Uraz et al., 2007 | Female | 48 | Doppler USCTA | Living donor for liver transplantation. Patient underwent right hepatectomy without complications. |
| Lee et al., 2013 | Female | 61 | CT | None (incidental finding). |
| Morshuis et al., 2015 | Female | 76 | Intraoperative finding | None. |

CT, computed tomography; CTA, computed tomography angiography; US, ultrasound.

Discussion

The LHV anomalous drainage into the CS is an extremely rare congenital abnormality usually reported as an incidental finding in imaging exams. To the best of our knowledge, this is the fourth reported case of an isolated LHV anomalous drainage [4–6]. Table 1 summarizes those case reports. Most cases reports describe this anomalous drainage with other cardiovascular malformations, such as persistent left superior vena cava [7], duplication of the superior or IVC [3], IVC containing with theazygos vein [3], subaortic valve stenosis [8], anomalous pulmonary venous drainage [1], atrial and ventricular septal defect [2].

The vitelline (omphalomesenteric), umbilical and cardinal veins are the 3 types of vessels composing the venous system in the 5th gestational week that lead blood to the sinus venosus [5,8]. The presence of an anomalous drainage of the LHV directly into the CS may be explained by the persistence of the left omphalomesenteric vein connection with the left horn of the sinus venosus during the fetal period [5]. The left horn of the sinus venosus eventually becomes the CS [8].

This anatomical abnormality should have no clinical or hemodynamic consequences. However, it has been suggested that it may be associated with atrial arrhythmias [1]. Radiologists should report the LHV anomalous drainage because of its surgical implications, including inability to be a living donor liver transplantation [6], technical difficulties during trans-CS interventions [5] and Fontan procedures [4], impairment of venous return during cardiac surgery using extracorporeal bypass [4], and impossibility to use the CS for retrograde cardioplegia [4].

Computed Tomography angiography (CTA) with multiplanar reconstruction is the “gold standard” in diagnostic imag-
ing because it’s noninvasive and faster when compared to conventional angiography. CTA provides a complete evaluation of the great vessels and can detect some of the other systemic venous maldevelopments that may come along with the LHV anomalous drainage [8]. The echocardiography can also detect this anatomical abnormality [5] and is particularly useful in patients with contraindications to CTA, but it has limited spatial resolution and limited windows with narrow fields of view.

In conclusion, the diagnosis of LHV drainage into the CS during preoperative evaluation can avoid intraoperative complications and may determine the preferred surgical approach. The best diagnostic imaging method is the CTA because it provides detailed anatomic characterization with the advantage of 3D reconstruction.

REFERENCES

[1] Karolczak MA, Mądry W, Zacharsa-Kokot E. Anomalous connection of the left hepatic vein to coronary sinus in a child with PAPVD. Surgical significance and diagnostic difficulties. Kardiochir Torakochirurgia Pol. 2016;13(1):49–51.

[2] Varan C, Ozker E, Gumus B, Turkoz R. Anomalous hepatic vein draining into the coronary sinus. Pediatr Cardiol 2011;32(8):1256–7.

[3] Milisavljevic M, Marinkovic S, Radak D, Cetkovic M, Vucurevic G, Trifunovic D. Duplication of the superior vena cava associated with atrial termination of the left hepatic vein. Phlebology 2013;28(7):369–74.

[4] Morshuis WG, de Lind van Wijngaarden RA, Kik C, Bogers AJ. Drainage of the Left Hepatic Vein into the Coronary Sinus, a Rare Intraoperative Finding. J Card Surg 2015;30(11):817–18.

[5] Lee C, Saremi F. Anomalous left hepatic vein draining into coronary sinus imaged with multidetector computed tomography. Clin Anat 2013;26(8):987–9.

[6] Uraz S, Duran C, Balci D, Akin B, Dayangac M, Kurt Z, et al. A very rare venous anomaly in a living liver donor: left hepatic venous connection to the right atrium. Transplant Proc 2007;39(5):1714–15.

[7] Bhatti S, Hakeem A, Ahmad U, Malik M, Kosolcharoen P, Chang SM. Persistent left superior vena cava (PLSVC) with anomalous left hepatic vein drainage into the right atrium: role of imaging and clinical relevance. Vasc Med 2007;12(4):319–24.

[8] Buehler M, Abdullah A, Lewis TJ. Left hepatic vein and persistent left superior vena cava drainage into the coronary sinus with subaortic valve stenosis. Int J Angiol 2011;20(4):243–6.