Case Report
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대한영상의학회지

Double Left Brachiocephalic Veins with Persistent Left Superior Vena Cava: A Case Report
지속 좌측 상대정맥과 동반된 중복 좌측 팔머리 정맥: 증례 보고

O Hyun Kwon, MD, Ji Kyoung Lim, MD, Jae Kyo Lee, MD, Mi Soo Hwang, MD
Department of Radiology, Yeungnam University College of Medicine, Daegu, Korea

Anomalous left brachiocephalic vein (ALBCV) is a rare condition of the major thoracic veins. It is usually associated with a congenital cardiac anomaly. Most reports on ALBCV are on aberrant left BCV, and there are few reports on double left BCV. Persistent left superior vena cava (PLSVC) is also a rare vascular anomaly that is caused by the failure of the left anterior cardinal vein to regress. To our knowledge, double left BCV with PLSVC has not been reported. Here, we report a case of double left BCV with PLSVC in a 72-year-old male patient with no previous cardiac abnormality.

Index terms
Anomalous Left Brachiocephalic Vein
Double Left Brachiocephalic Veins
Persistent Left Superior Vena Cava
CT

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Corresponding author: Jae Kyo Lee, MD
Department of Radiology, Yeungnam University College of Medicine, 170 Hyeonchung-ro, Nam-gu, Daegu 705-717, Korea.
Tel. 82-53-620-3047 Fax. 82-53-653-5484
E-mail: stallin64@naver.com

INTRODUCTION

The complex anatomy of the great vessels in the mediastinum give rise the occasional occurrence of anomalies. These anomalies are usually associated with congenital heart disease. An anomalous left brachiocephalic vein (ALBCV) is rare. The incidence of ALBCV with congenital heart disease is 0.2–1%, whereas in the general population, the incidence of this anomalous vein without congenital heart disease is 0.06–0.37% (1, 2). Most reports on ALBCV are on aberrant left BCV, and there are few reports on double left BCV (3). The double left BCV, also designated as the double left innominate vein or a duplication of the left innominate vein, is an exceptionally rare congenital anomaly. The most common variant of this anomaly is the coexistence of a retroaortic left brachiocephalic vein and a normally placed left brachiocephalic vein (3).

Persistent left superior vena cava (PLSVC), while uncommon, is the most common thoracic venous anomaly. PLSVC occurs in 0.3% of the general population, but is more common in patients with congenital heart disease (4–4.3%) (4). Aberrant left BCV with PLSVC is very rare and was reported by Chen et al. (2). To our knowledge, double left BCV with PLSVC has not been reported yet. Here, we report a case of double left BCV with PLSVC in a 72-year-old male patient with no existing cardiac abnormality.

CASE REPORT

A 72-year-old male was admitted to our hospital due to an incidental lung mass on his chest radiograph. A chest CT scan was performed for further evaluation of the lung nodule, and revealed double left BCV and PLSVC (Fig. 1). The left BCV was divided into two branches: the anterior branch was a normally placed left brachiocephalic vein, and the posterior branch coursed below the aortic arch and drained into the right superior vena cava (SVC). The PLSVC was formed by the left internal jugular vein and the left subclavian vein.

The PLSVC connected to the right atrium via the coronary si-

nus. The right BCV and the right SVC were normal and the man not diagnosed with any other cardiovascular anomaly. Percutaneous needle biopsy was performed on the right middle lung nodule, and the histopathologic finding was squamous cell carcinoma of the lung. For treatment, right middle lobectomy with mediastinal lymph node dissection was performed.

DISCUSSION

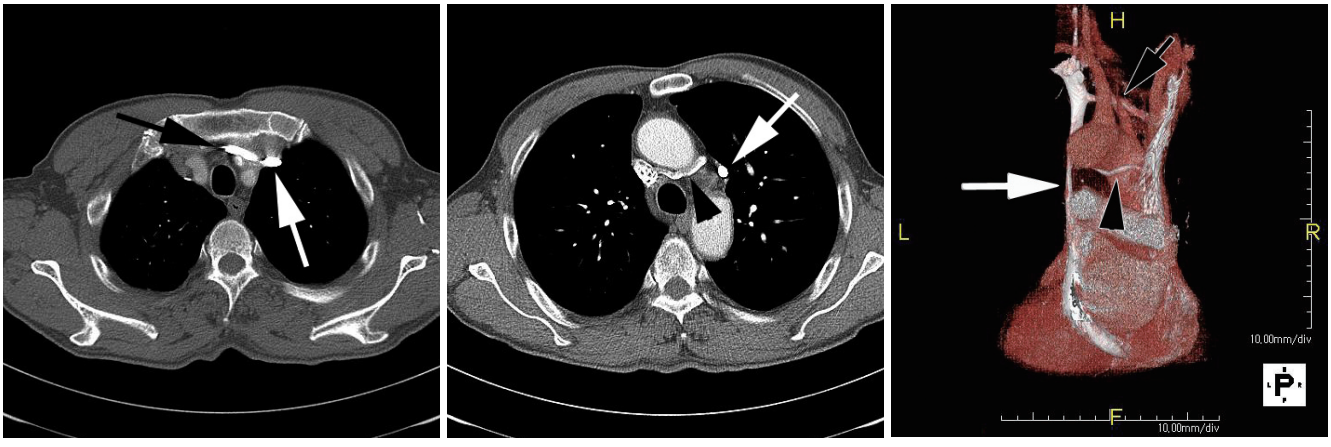
Normally, the union of the left subclavian vein and the left internal jugular vein forms the left BCV behind the sternoclavicular joint. The left BCV passes across the mediastinum and courses obliquely inferior and anterior to the ascending aorta or the brachiocephalic artery to the right upper chest (3). Rarely, this vein takes an anomalous course. While the exact cause of an ALBCV is unknown, the most accepted mechanism is the interruption of the upper anastomosis between the right and left anterior cardinal veins (1, 2).

There are several classifications of ALBCV. Takada et al. (3) classified the types of aberrant and double left BCV according to the course of the aberrant left BCV. Chen et al. (2) suggested several theories and patterns of aberrant and double left BCV. The double left BCV without PLSVC had also been reported by Takada et al. (3) and Subirana et al. (5), one in the normal position and the other crossing beneath the aortic arch.

The classification of the embryological anomalies of SVC has been presented by Nandy and Blair (6) and Starck (7). The most common subtype of PLSVC results in the presence of both left and right SVCs. A bridging brachiocephalic vein may or may not be present. A single PLSVC is much rarer. Variations have also been reported in the insertion of PLSVC. In 90% of cases, the PLSVC connects to the right atrium via the coronary sinus and has no hemodynamic consequence. Our patient has double SVC: the right one is normal whereas the left one, formed by the left internal jugular vein and the left subclavian vein, is thinner and drains into the right atrium via the coronary sinus.

ALBCV accompanied by PLSVC is extremely rare. Webb et al. (8) reported that PLSVC is associated with the absence of BCV. Chen et al. (2) reported that the presence of PLSVC was significantly less common in situs solitus patients who had ALBCV than in those who did not ($p < 0.05$ in the comparison of the tetralogy of Fallot, the double outlet of the right ventricles, the ventricular septal defect, and the atrial septal defect subgroups). To our knowledge, double left BCV with PLSVC has not been reported yet.

ALBCV and PLSVC are usually incidental findings in many cases. In a non-contrast-enhanced CT scan, they can be misinterpreted as enlarged lymph nodes or central pulmonary arteries. In patients with other cardiac anomalies, diagnosis can become difficult. Carefully tracing these vascular structures through sequen-



A B C

Fig. 1. Double left brachiocephalic veins (BCV) with persistent left superior vena cava (PLSVC) in a 72-year-old male patient.
A. Axial image of the contrast-enhanced CT scan at the level above the aortic arch, showing that the normally placed branch of the left BCV (black arrow) courses obliquely anterior to the ascending aorta. PLSVC is also noted (white arrow).
B. At the level of the ascending aorta, subaortic branch of the left BCV (arrowhead) showing the obliquely downward course behind the ascending aorta and drainage into the right SVC. PLSVC is also noted (white arrow).
C. Three-dimensional reconstruction images of the PA view revealing two connections between the two SVCs through the double left BCV. Black arrow = normally placed branch of the left BCV, white arrow = PLSVC, arrowhead = subaortic branch of the left BCV.

tial images is the key to their differentiation.

Clinically, knowledge of these anomalies is important and should be considered when inserting a central venous catheter or in cardiac surgeries. These anomalies may cause technical difficulties during pacemaker insertion or central venous line placement via the left arm approach. For patients undergoing cardiac surgery, the superior vena caval cannulation for a cardiopulmonary bypass must be done in a more caudal fashion than usual to avoid obstruction of the retroaortic branch of the left BCV.

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지속 좌측 상대정맥과 동반된 중복 좌측 팔머리 정맥: 증례 보고

권오현 · 임지경 · 이재교 · 황미수

중복 좌측 팔머리 정맥는 드문 혈관 구조 이상으로 좌측 팔머리 정맥의 변이의 종류 중에서도 대단히 드물게 볼 수 있는 증례이며, 지속 역시 드물게 볼 수 있는 발생학적 변이의 한 종류이다. 저자는 72세 남자의 폐 결절 진단을 위한 흉부 전산화단층촬영에서 우연히 보인 중복 좌측 팔머리 정맥과 지속이 동반된 증례 보고를 하고자 한다.

영남대학교 의과대학 영상의학과학교실