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Case Report

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Clinical Case of a Persistent of left Superior Vena Cava

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ABSTRACT

A persistent left superior vena cava is formed by remains of the oblique vein of the left atrium, which is not completely degenerated during embryonic development. The incidence is approximately 0.3% in the general population. Approximately 80-92% of PLSVCs drain into the right atrium through the coronary sinus. In most cases, the persistent left superior vena cava (PLSVC) is asymptomatic and discovered accidentally. The persistence of a left superior vena cava is an intrinsically cardiac anomaly cardiovascular disease, which can lead to serious complications during catheterization or internal jugular vein. We describe a patient with a history of a diagnosis of atrioventricular blockade grade 3, which has an additional PLSVC, which flows into the coronary sinus.

KEYWORDS: Left superior vena cava, Pacemaker, Vessels anomaly, Cardiac diseases

INTRODUCTION

The presence of an additional left superior venacava is a congenital anomaly of the cardiovascular system and occurs in 0.3-0.4% of cases. This pathology is 2-5% among all congenital heart defects. Left superior vena cava is formed because of violation of the process of obliteration of the left anterior cardiac vein, which in the intrauterine period of development gives venous blood through the great cardiac vein and coronary sinus to the right atrium.Two anterior (right and left) and two posterior cardiac veins represent the venous system in the early embryonic period. The anterior and posterior cardiac veins, merging, form two Cuvier's ducts, flowing into the venous sinus of the heart. The anterior veins are larger in diameter, their distal segments correspond to the internal jugular veins, which the subclavian veins, formed during the development of the upper extremities, flowinto. The heart moves in the caudal direction in the process of embryonic development. The Cuvier's ducts are oriented longitudinally. Thus, the embryo has two superior cava veins at the age of 2 months. Then the left unnamed vein develop between them as a transverse anastomosis. By 5 months of intrauterine period, the caudal part of the superior vena cava adjacent to the heart forms the common sinus of the cardiac veins. The segment of the vein between this sinus and the transverse anastomosis partially or completely obliterates. At the same time,the part of the left cardiac vein going to the heart disappears. The distal part of the right cardiac vein (right unnamed vein) has an almost vertical direction and, uniting the left unnamed vein, forms the upper vena cava. Various violations of these embryological transformations lead to malformations of the venous system [2,3].

Remaining of blood flow through both Cuvier's ducts leads to the formation of two (left and right) superior cava veins. The left superior vena cavais formedbecause of a violation of the process of obliteration of the left anterior cardiac vein, which during the prenatal period gives venous blood through the large cardiac vein and the coronary sinus to the right atrium. In rare cases (~2%), violation of the left cardiac vein obliteration is combined with obliteration of a similar vein on the right side, which leads to the appearance of a single left superior vena cava and atresia of the normal right superior vena cava.

However, in most cases left vena cava superior is additional to the normal developedright superior vena cava [1,5,6,7].

CLINICAL CASE

The ambulance team delivered the male born in 1939 to one of the Central hospitals of Grodno region with the diagnosis of AV-blockade of the 3rd degree. A temporary endocardial electrode was installed. The patient was transferred to the Grodno Regional Clinical Cardiology Center for implantation of a permanent system of electro cardio stimulation. During examination with the help of electrocardiogram, the atrioventricular blockade of 3rd degrees and rhythm of pace maker was established. The echocardiography showed the heart cavity was not dilated and a slight expansion of the coronary sinus. It was noted on a chest x-ray that a temporary endocardial electrode is installed through the right internal jugular vein and goes to the left of the vertebral column (Figure.1). The presence of an additional left vena cava was suspected.

Figure.1: The electrode passing through the right internal jugular vein.

The left subclavian vein waspunctured. Contrast phlebography was performed in result of which an additional left superior vena cava empting into the coronary sinus was revealed. Ventricular and atrial endocardial electrodes are conducted into the chambers of the heart through the coronary sinus and implanted into the interventricular septum and wall of the right atrium (Figure. 2).

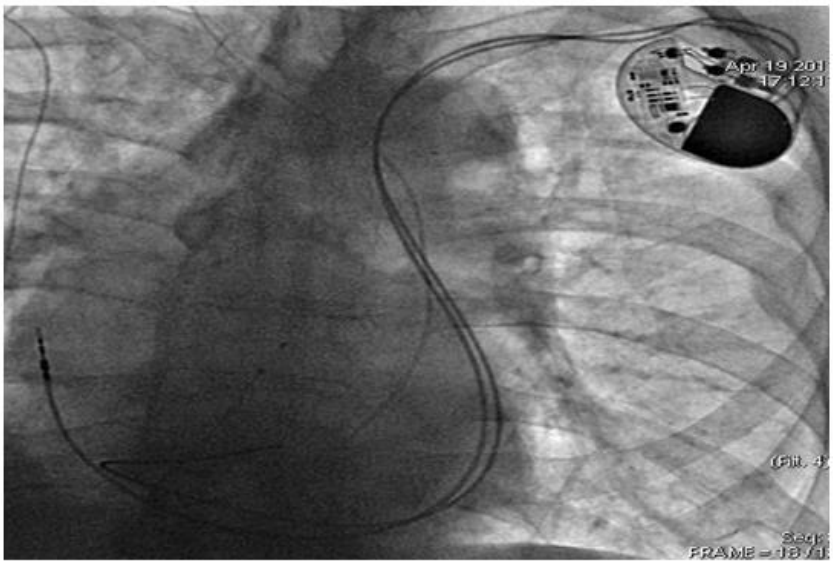

Figure 2: Endocardial electrodes, inserted into the heart chambers through the coronary sinus.

The electrode parameters were measured:

1) Atrial electrode: sensitivity is 2.5 mV, stimulation threshold is 0.5 mA

2) Ventricular electrode:sensitivity is 10 mV, stimulation threshold is 0.mA

CONCLUSION

The left superior vena cava is a rare congenital anomaly and usually does not cause the functional disorders and does not give any specific clinical manifestations. However, sometimes there may be various cardiac arrhythmias and conduction disorders. Most often, the superior vena cavais detected accidentally during cardiac catheterization or angiocardiography. Its existence can be suspected based on detection of the expanded coronary sinus in echocardiography. It is necessary to carry out additional research methods to clarify the diagnosis in this case. Although the presence of left superior vena cavausually does not lead to hemodynamic disorders, it is important to know about its existence. The clinical significance of this anomaly is acquired during catheterization of central veins, electrophysiological examination or radiofrequency ablation, implantation of pacemakers or cardioverters-defibrillators [3,4,5]. The presence of left superior vena cava can cause complications during intracardiac manipulations [4]. In our clinical case, we suspected the presence of left superior vena cava during catheterization of the superior vena cava. Diagnostic phlebography allowed confirming the diagnosis and safely performing implantation of a two-chamber pacemaker in the right subclavian region. This case illustrates the variability of anatomy of the main and central vessels, which requires careful examination of patients, especially in the event of technical difficulties during catheterization

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