

Gerbode type defect after trans-septal puncture for ablation of left-sided accessory pathway

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Case Report

Abstract

BACKGROUND: Trans-septal puncture (TSP) is a safe and effective method to approach left atrium and ventricle. Nowadays, cardiac electrophysiologists perform this procedure routinely to treat left-sided arrhythmias.

CASE REPORT: A 45-year-old man was referred to our center due to Wolff-Parkinson-White (WPW) syndrome. After trans-septal puncture, contrast injection into the sheath showed that it was in the left ventricle (LV) rather than left atrium. Trans-esophageal echocardiography confirmed left ventricle outflow tract to right atrial (RA) jet. Follow-up echocardiography showed that the tract was present up to 18 months, but considering that the patient was asymptomatic, endovascular or surgical closure was not done.

CONCLUSION: Our case with an 18-month follow-up period, highlights the conservative approach in asymptomatic patients with this complication.

Keywords: Radiofrequency Catheter Ablation, Adverse Effects, Punctures

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Introduction

Trans-septal puncture (TSP) is a safe and effective method to approach left atrium and ventricle. Nowadays, cardiac electrophysiologists perform this procedure routinely to treat left sided arrhythmias.¹ Although pericardial effusion and tamponade are among the most serious complications of TSP,² complications such as inadvertent puncture of aorta, and even aorto-right atrial shunt are rarely reported.^{3,4}

Herein, we illustrate the occurrence of a rare TSP complication, and our approach to handle it.

Case Report

A 45-year-old man was referred to our center due to Wolff-Parkinson-White (WPW) syndrome for radiofrequency ablation. General physical examination was normal. Electrocardiography (ECG) showed pre-excitation in favor of left posterior accessory pathway (AP). Echocardiography was also normal.

Guided by fluoroscopy, right atrium (RA), right ventricle, and coronary sinus catheters were introduced into the corresponding heart chambers. Basic electrophysiology study confirmed that AP was located in the posterior part of mitral valve ring; so we decided for TSP. This was the first time

we used HeartSpan Steerable (Merit Medical Systems, South Jordan, UT, United States) sheath and the needle for TSP; in the previous TSP procedures, we used the Agilis™ sheath (Abbott, Saint Paul, MN, United States). Withdrawal of trans-septal sheath from superior vena cava into RA after 2 jumps usually places the introducer system in the fossa ovalis; but in this patient, this maneuver did not work despite several attempts. Finally, we could place the sheath into lower part of the interatrial septum, just above coronary sinus catheter in left anterior oblique projection. Jerky puncture with the needle was done and small amount of contrast injection showed that the needle has traversed the interatrial septum. So, we advanced the steerable sheath over the needle to the left side, and then the needle was withdrawn. However, to our surprise, contrast injection into the side branch of the sheath showed that it was in the left ventricle (LV) rather than the left atrium (Figure 1-A). We advanced the 0.032" guidewire through the sheath to LV, and retracted the sheath to RA. Continuous arterial blood pressure monitoring did not show hemodynamic compromise, nor did echocardiography show pericardial effusion; so we

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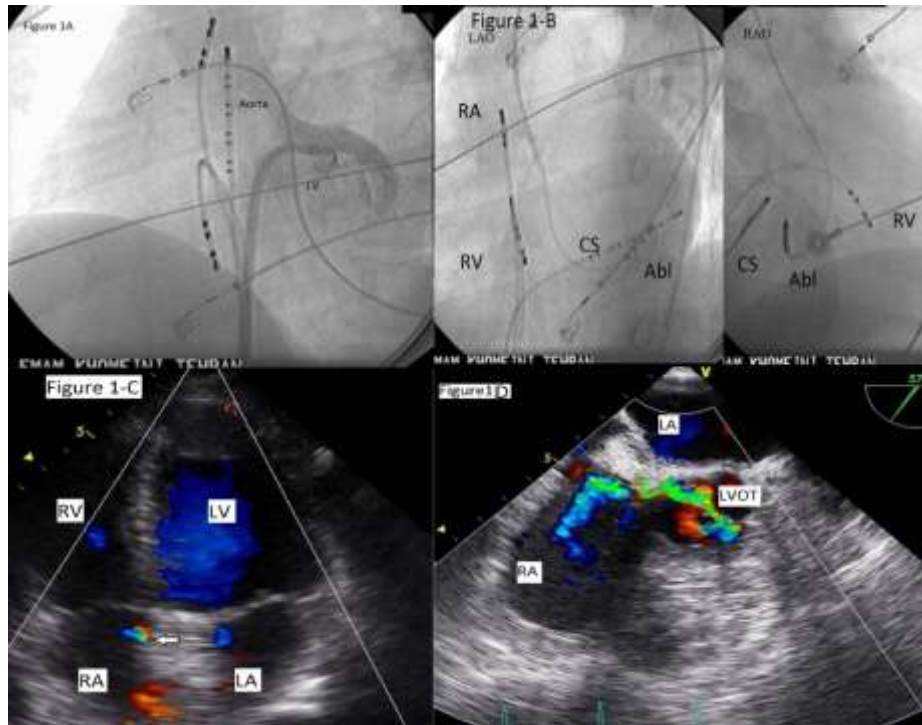


Figure 1. A: Contrast injection after trans-septal puncture through the sheath shows that LV is penetrated. B: RAO and LAO projections at the site of successful ablation (posterior of mitral valve ring). C: TTE shows abnormal flow in the RA. D: TEE shows LV outflow tract to RA flow.

Abl: Ablation catheter; CS: Coronary sinus; LA: Left atrium; LAO: Left anterior oblique; LV: Left ventricle; RA: Right atrium; RAO: Right anterior oblique, RV: Right ventricle; TEE: Trans-esophageal echocardiography; TTE: Transthoracic and echocardiography

decided to perform radiofrequency ablation of AP via the retrograde trans-aortic approach that was successful (Figure 1-B).

We transferred the patient to coronary care unit (CCU) for better hemodynamic monitoring. On the next day, transthoracic and trans-esophageal echocardiography showed LV outflow tract to RA jet (Figure 1-C and 1-D respectively). The patient was discharged uneventfully. Follow-up echocardiography showed that the tract was present for up to 18 months without any evidence of cardiac enlargement (Figure 2). Since the patient was asymptomatic, endovascular or surgical closure was not attempted.

Discussion

Our case is unique in two aspects; first, a very rare complication of TSP, RA to LV penetration (Gerbode) and fistula formation, but more interestingly is the second, persistence of this fistula over 18 months of medical follow-up without any intervention usually needed in similar symptomatic cases.⁵

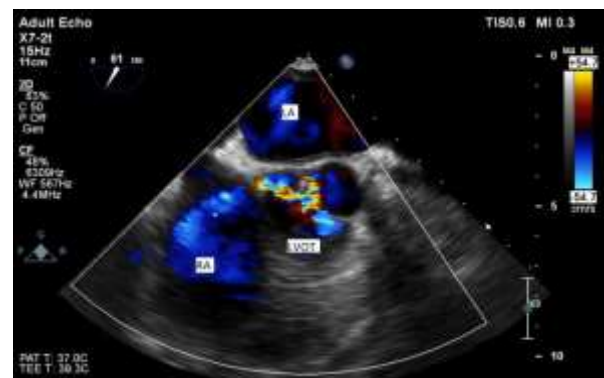


Figure 2. Persistent LV to RA fistula 18 months later
LA: Left atrium; LV: Left ventricle; RA: Right atrium; LVOT: Left ventricular outflow tract

Can et al. presented a case with Gerbode type defect after ablation of atrioventricular node from the LV to RA. They stated that radiofrequency ablation was uncomplicated and at 5-month routine medical follow up, they found a LV to RA fistula. At 14-month follow-up, the size of defect did not show any progression; so they did not perform any intervention.⁶

The most similar article to ours was presented by Chavarria and Goldberg.⁷ They presented left ventricular penetration detected during trans-septal puncture of interatrial septum for ablation of left posterior accessory pathway. After discovering the complication in the catheterization laboratory, they postponed the definite procedure to another day. They addressed that the patient was asymptomatic during several weeks follow-up.

In our case, we speculated that the superior part of membranous septum was punctured inadvertently, and a Gerbode-like defect with flow from the LV to the RA was made. It is predictable that if intracardiac echocardiography was available in our electrophysiology laboratory, this complication could be avoided. Our case, with 18-month follow-up, highlights the conservative approach in asymptomatic patients with this complication.

Acknowledgments

None.

Conflict of Interests

Authors have no conflict of interests.

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