

## When an Elongated Eustachian Valve Resembled a Chimney

A 65-year-old woman presented to our outpatient arrhythmia clinic with a complaint of palpitation. She had a history of surgical atrial septal defect closure many years earlier. Electrocardiography showed atrial flutter. She had consumed warfarin for several months. We decided to ablate this arrhythmia. Transthoracic echocardiography demonstrated a normal left ventricular size, mild left ventricular systolic dysfunction (ejection fraction=45%), right ventricular enlargement with mild systolic dysfunction, mild left and severe right atrial enlargement with severe tricuspid regurgitation, and an estimated systolic pulmonary pressure of 35 mmHg. Additionally, an elongated Eustachian valve (21 mm) was noted in the subcostal view (Figure 1). In the electrophysiology laboratory, no electrical activity was recorded when the ablating catheter was moved from the inferior vena cava up to the mid right atrium. Consequently, we injected a contrast medium into the inferior vena cava–right atrium in order to better visualize the inferior vena cava and the right atrial anatomy in the anterior-posterior projection. A volcano-like inferior vena cava was illustrated, extending to the mid right atrium because of the elongated Eustachian valve (Figure 2). Electrophysiology study revealed isthmus-dependent lower loop atrial flutter, which was successfully ablated.



Figure 1. Elongated Eustachian valve (arrow) in the subcostal view of transthoracic echocardiography  
IVC, Inferior vena cava; LA, Left atrium; RA, Right atrium

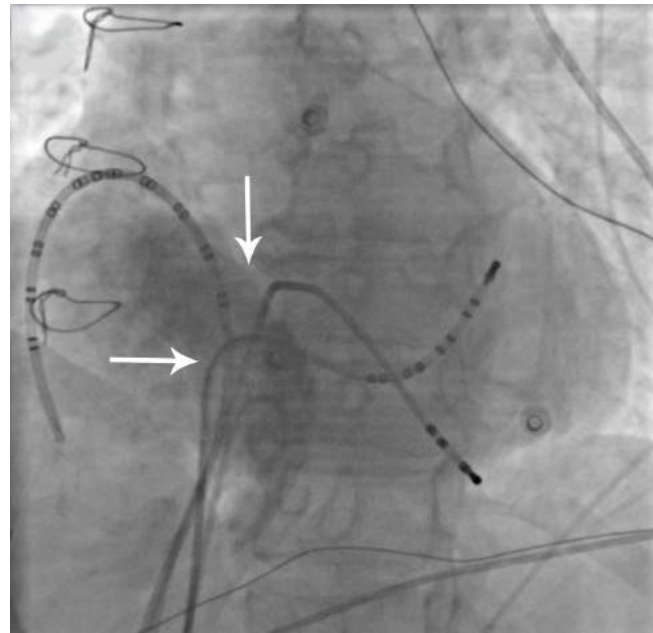


Figure 2. Volcano-like appearance (arrows) of the inferior vena cava in venography

It appears that a probable alteration in the alignment of the interatrial septum in the wake of previous surgery and right atrial enlargement when combined with an elongated Eustachian valve can lead to the appearance of a volcano-like inferior vena cava. Moreover, an elongated Eustachian valve impedes the recording of the electrical activity.

**To watch the following videos, please refer to the relevant URLs:**

<https://jtch.tums.ac.ir/index.php/jtch/article/view/1035/909>

Video 1. Elongated Eustachian valve in the subcostal view of transthoracic echocardiography

<https://jtch.tums.ac.ir/index.php/jtch/article/view/1035/910>

Video 2. Contrast injection in the high inferior vena cava, demonstrating a volcano-like inferior vena cava

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