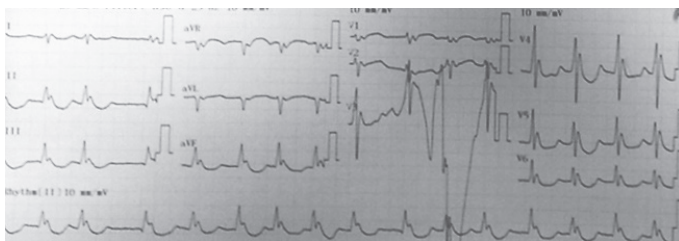


## A hypothermic case with giant Osborn waves and atrial fibrillation after using synthetic cannabinoid

Hypothermia is a condition wherein the body temperature drops below 35°C when an individual is unconscious. In prolonged moderate hypothermia (28–32°C), progressive drops in the pulse rate and increases in atrial and ventricular arrhythmia and Osborn waves are observed in electrocardiography (ECG). Unconsciously, staying outside for an extended time in extreme cold is the most important cause of hypothermia. In recent years, a significant social problem is the increase in the number of people using synthetic cannabinoids (SC) in public places. A frequent result of SC use is severe deterioration in consciousness and perception.

A 22-year-old male patient, who was found unconscious in a park and was brought to the emergency department by 112 emergency services, was reported to have used SC. During vital sign examination, body temperature was too low to be measured, SpO<sub>2</sub> level was 93%, and the other parameters were normal. There was no obvious sign of injury on his body. The initial assessment led us to believe that the patient was in a hypothermic condition because of unconsciousness after drug use and exposure to cold. Atrial fibrillation and giant Osborn waves were observed in his ECG (Fig.1, 2). Four hours later, the body temperature increased to 35.7°C. ECG performed for control revealed that Osborn waves disappeared, and the rhythm returned to a normal sinus rhythm (Fig. 3). Although there was no thermometer that measures body temperature below 35°C in our department, typical Osborn waves observed in ECG led us to consider that the body temperature was between 28 and 32°C and to intervene in the patient early.



**Figure 1.** When first admitted, the hypothermic patient's ECG demonstrated Osborn waves and atrial fibrillation



**Figure 2.** Osborn waves and atrial fibrillation was also observed in the patient's ECG after 2 h of observation (body temperature, 35°C)



**Figure 3.** Normal sinus rhythm detected in the patient's ECG after 4 h of observation (body temperature, 35.7°C)

**Serkan Doğan, Canan Akman, Alp Yılmaz, Utku Murat Kalafat, Tark Ocak**  
 Department of Emergency, Kanuni Sultan Süleyman Training and Research Hospital, İstanbul-Turkey

**Address for Correspondence:** Dr. Utku M. Kalafat

Atakent Mah., Turgut Özal Cad., No:1

Altınşehir, Küçükçekmece, İstanbul-Türkiye

Phone: +90 507 262 74 04 E-mail: utkumuratk@yahoo.com

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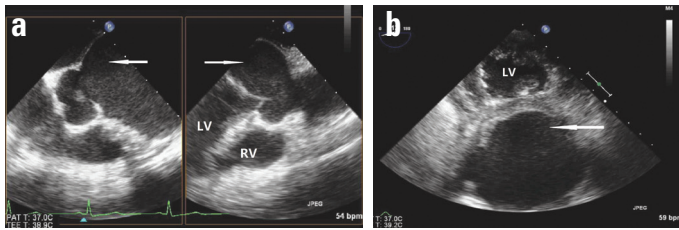
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## Compression of left ventricle by a rare giant unruptured sinus of Valsalva aneurysm

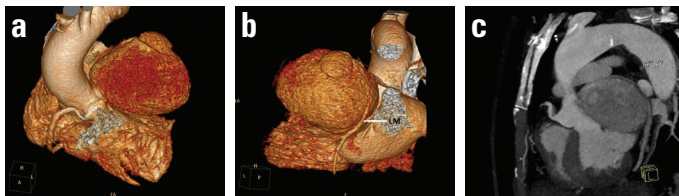
A 60-year-old previously healthy woman was admitted with exertional dyspnea. She was a non-smoker and -drinker. Physical examination was insignificant, except for a soft early diastolic murmur. Further examination was performed. Blood tests and electrocardiogram were normal. Transesophageal echocardiography revealed a giant unruptured left sinus of Valsalva aneurysm (SVA) with spontaneous echo contrast, which severely compressed the left ventricle (Fig. 1, arrow, Video 1, 2). The 64-multidetector computed tomography angiogram with iodinated contrast injection was used to demonstrate the giant aneurysm with a maximal diameter of 8.7 cm, and the left main coronary artery was not involved (Fig. 2).

Because of a high risk of thrombus formation in SVA and the potentiality of a fatal rupture, an aneurysmectomy (Fig. 3, arrow) and reconstruction of the coronary arteries were performed under cardiopulmonary bypass. The postoperative course was uneventful. Pathology results revealed the breakage of the intimal elastic fiber, lymphocytic infiltration, and fibroplastic proliferation of the tunica media. Calcification foci and hyaline degeneration with cystic degeneration were also observed in the tunica media (Fig. 4).

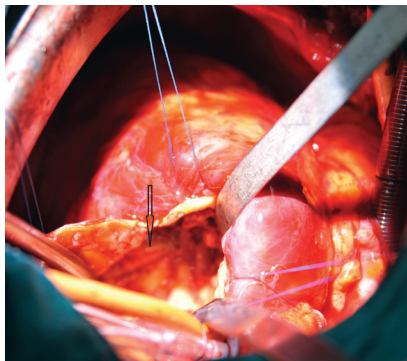
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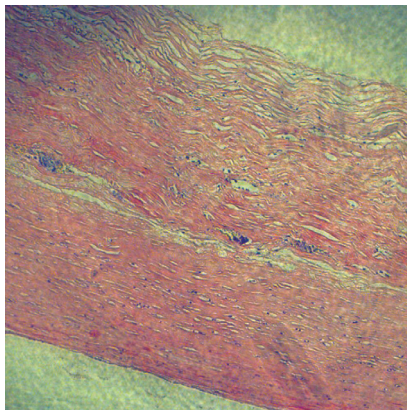
**Figure 1.** (a) Transesophageal echocardiography showing a giant unruptured left sinus of Valsalva aneurysm, arrow. (b) Transesophageal echocardiography revealing the aneurysm compressing the left ventricle severely, arrow



**Figure 2.** A 64-multidetector computed tomography angiogram. (a) The three-dimensional reconstruction demonstrating the entire aneurysm. (b) The three-dimensional reconstruction demonstrating the left main coronary artery and its bifurcation. (c) Sagittal view showing the giant aneurysm that compressed the outflow of left ventricle



**Figure 3.** Intraoperative photograph demonstrating the intracavity of the aneurysm, arrow



**Figure 4.** Microscopy (x50), hematoxylin and eosin stain

**Video 1.** Transesophageal echocardiography revealing a giant unruptured left sinus of Valsalva aneurysm.

**Video 2.** Transesophageal echocardiography revealing the aneurysm severely compressing the left ventricle.

Hong Qian, Qin Ouyang\*, Yajiao Li\*\*, Wei Meng  
Department of Cardiovascular Surgery, \*Radiology, \*\*Cardiology,  
West China Hospital of Sichuan University, Chengdu-*China*

**Address for Correspondence:** Wei Meng

Guoxue xiang 37 Wuhou District, Chengdu, 610041-*China*

Phone: +86 028 8 542 24 93 Fax: +86 028 85422493

E-mail: mengwei1116@126.com

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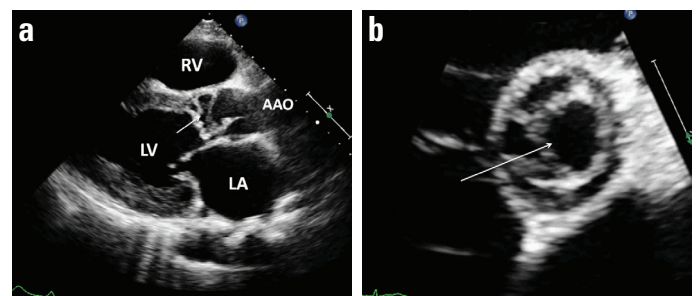
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## Aortic valve aneurysm involved in interventricular septum

A 39-year-old man with no relevant medical history presented to the outpatient department of our hospital with complaints of intermittent fever and exertional dyspnea since 2 months. On physical examination, a grade 3/6 diastolic murmur was heard. Blood cultures had persistently grown gram-positive enterococci. Two-dimensional transthoracic echocardiogram that was performed revealed a large aneurysm in the right coronary leaflet involving the basal septum (Fig. 1, Video 1) with severe aortic insufficiency and left ventricular chamber dilatation. Color Doppler echocardiography identified perforation of the aneurysm as a cause of aortic insufficiency and demonstrated diastolic aortic regurgitation from the perforation flowing into the left ventricular outflow tract (Fig. 2). Three-dimensional transesophageal echocardiography more clearly revealed the aneurysm with multiple perforations (Fig. 3, Video 2). After a regular antibiotic treatment, the patient's blood cultures were negative, and an operation was finally performed. The same findings were observed as described above.

Aortic valve aneurysms are rare. There are only a few studies reporting aortic valve aneurysms because of endocarditis. We used three-dimensional transesophageal echocardiography to examine an extremely rare large aneurysm that was involved in the interventricular septum with multiple perforations.

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**Figure 1.** On two-dimensional transthoracic echocardiogram, arrow points to a large aneurysm in the right coronary leaflet involved in basal septum. AAO - ascending aorta; LA - left atrium; LV - left ventricle; RV - right ventricle