Aneurysm of the right atrial appendage in an elderly patient

Yaşlı bir hastada sağ atriyum apendiks anevrizması

Nilüfer Ekşi Duran, M.D., Emre Ertürk, M.D., Sabahattin Gündüz, M.D., Mehmet Özkan, M.D.

Department of Cardiology, Kartal Koşuyolu Heart and Research Hospital, İstanbul

A 72-year-old male patient presented with a complaint of pain in both legs during short walks of less than 50 meters. Physical examination showed weak arterial pulses in both lower extremities. Electrocardiographic and telecardiographic evaluations were normal. A previous abdominal ultrasonography examination performed for abdominal pain showed an abdominal aortic aneurysm. Coronary angiography findings were normal; however, peripheral angiography showed an abdominal aortic aneurysm and extensive critical bilateral peripheral artery disease. Transthoracic echocardiography disclosed an aneurysmal structure neighboring the right atrium. Transesophageal echocardiography demonstrated a 30x18-mm chamber suggestive of a right atrial appendage aneurysm. Cardiac magnetic resonance imaging confirmed the presence of the right atrial appendage aneurysm, 25x15 mm in size, over the tricuspid valve. The neck of the aneurysm was 11 mm. The patient underwent surgery which included grafting of the abdominal aorta and aortobifemoral bypass. He was discharged uneventfully on oral anticoagulant therapy.

Key words: Atrial appendage; echocardiography; diverticulum/congenital; heart aneurysm; heart atria/abnormalities.

Yetmiş iki yaşındaki erkek hasta, her iki bacakta 50 metreden daha az yürümekle ortaya çıkan ağrı yakınmasıyla başvurdu. Fizik muayenede, her iki ekstremitede arteryel nabızların zayıflamış olduğu görüldü. Elektrokardiyografik ve telekardiyografik değerlendirmeler normal bulundu. Hastaya karın ağrısı nedeniyle daha önce batın ultrasonografisi yapılmış ve abdominal aortta anevrizma saptanmıştı. Koroner anjiyografi bulguları normal olan hastanın perifer anjiyografisinde, abdominal aort anevrizması ile birlikte iki taraflı yaygın ciddi perifer arter hastalığı saptandı. Transtorasik ekokardiyografide sağ atriyum ile komşuluğu olan anevrizmatik bir yapı izlendi. Transözofageal ekokardiyografide sağ atriyum apendiks anevrizmasını andıran, 30x18 mm boyutlarında bir boşluk saptandı. Kardiyovasküler manyetik rezonans incelemede, triküspit kapak üzerinde sağ atriyum apendiks anevrizması varlığı doğrulandı. Anevrizmanın boyutları 25x15 mm, boynu 11 mm ölçüldü. Cerrahi girişimde abdominal aorta greft uygulandı ve aortobifemoral baypas yapıldı. Ameliyat sonrası komplikasyon izlenmeyen hasta, oral antikoagülan tedavi ile taburcu edildi.

Anahtar sözcükler: Atriyum apendiksi; ekokardiyografi; divertikül, doğuştan; kalp anevrizması; kalp atriyumu/anormallik.

There are few cases of right atrial appendage aneurysm in the literature.[1-3] We, herein reported a very rare case of right atrial appendage aneurysm which was incidentally detected during echocardiographic evaluation.

CASE REPORT

A 72-year-old male patient presented with a complaint of pain in both legs during short walks of less than 50 meters. He did not have diabetes mellitus or hypertension., but had a 50-year history of smoking, two packs a day. Physical examination showed weak arterial pulses in both lower extremities, but the cardiovascular system examination was normal. His blood pressure was 130/85 mmHg and pulse rate was 76/min. The electrocardiogram showed normal sinus rhythm with no abnormal finding. Telecardiographic evaluation was within normal limits. Laboratory findings were as follows: triglyceride 151 mg/dl, cholesterol 262 mg/dl, HDL-cholesterol 62 mg/dl, and LDL-cholesterol 170 mg/dl. A previous abdominal ultrasonography examination performed for abdominal pain showed an abdominal aortic aneurysm with a maximum diameter of 4.5 cm, extending about 6 cm from the

Received: January 7, 2008 *Accepted:* March 31, 2008

Correspondence: Dr. Nilüfer Ekşi Duran. Beyazkaranfil Sok., No: 4, D: 10, 34178 Acıbadem, Kadıköy, İstanbul, Turkey.
Tel: +90 216 - 545 26 73 e-mail: eksduran@yahoo.com

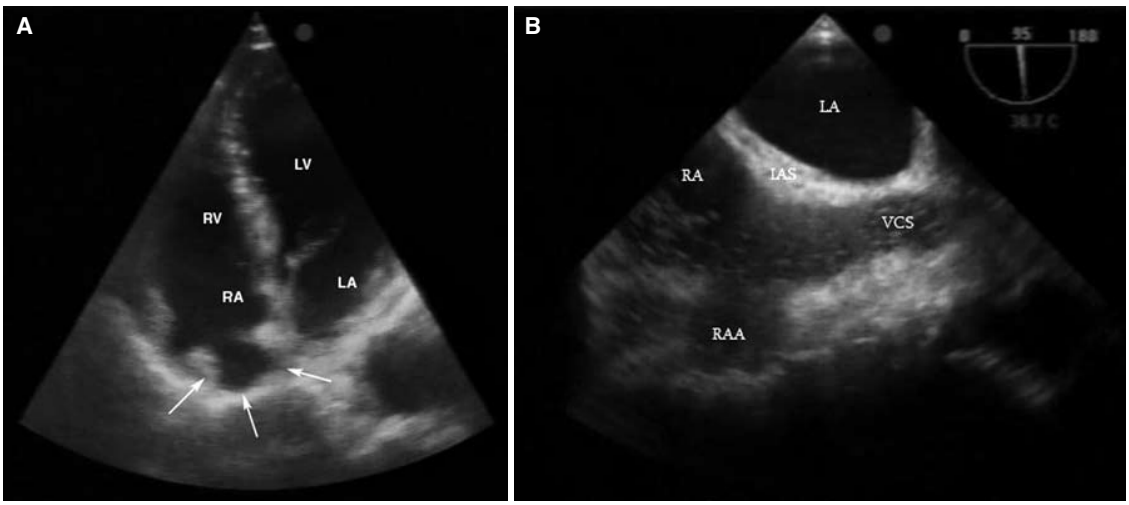

Figure 1. (A) Transthoracic echocardiography from the apical four-chamber view demonstrating an aneurysmal structure related to the right atrium (arrows). **(B)** Transesophageal echocardiography showing a right atrial appendage aneurysm and atrial structures. LA: Left atrium; LV: Left ventricle; RA: Right atrium; RV: Right ventricle; RAA: Right atrial appendage aneurysm; IAS: Interatrial septum; VCS: Vena cava superior.

lower part of the abdominal aorta to the iliac bifurcation. Coronary angiography findings were normal, however, an abdominal aortic aneurysm and extensive critical bilateral peripheral artery disease were determined on peripheral angiography. Transthoracic echocardiography (TTE) disclosed an aneurysmal structure with undetermined borders, neighboring the right atrium (Fig. 1a). Transesophageal echocardiography (TEE) demonstrated a 30x18-mm chamber suggestive of a right atrial appendage aneurysm, and a patent foramen ovale (Fig. 1b). For further delineation of this abnormality, cardiac magnetic resonance imaging (MRI) was performed, which showed a right atrial appendage aneurysm, 25 x 15 mm in size, over the tricuspid valve. The neck of the aneurysm was measured as 11 mm, and there was no thrombus formation in the aneurysm (Fig. 2).

Surgery for the abdominal aortic aneurysm and peripheral artery disease was performed, which included grafting of the abdominal aorta, and aortobifemoral bypass. The patient was discharged uneventfully on oral anticoagulant therapy.

DISCUSSION

Right atrial aneurysm is very rare, and its origin is not clear. Although most right atrial aneurysms have a congenital origin, acquired cases due to trauma leading to dissection of the right atrial pericardium have also been reported.[4] There appears to be no gender or race predilection,[5] and genetic predisposition has not been confirmed, despite a report of familial occurrence.[6]

Four distinct types of right atrial aneurysms exist:[6] *(i)* diffuse enlargement of the right atrium; *(ii)* single aneurysm or diverticulum in the right atrium; *(iii)* multiple aneurysms or diverticula in the right atrium; *(iv)* coronary sinus aneurysm or diverticulum. Diffuse right atrial aneurysm is the most common form. Single diverticulum in the right atrium usually arises from the right atrium free wall and is connected to the right atrium by a thin neck; those arising from

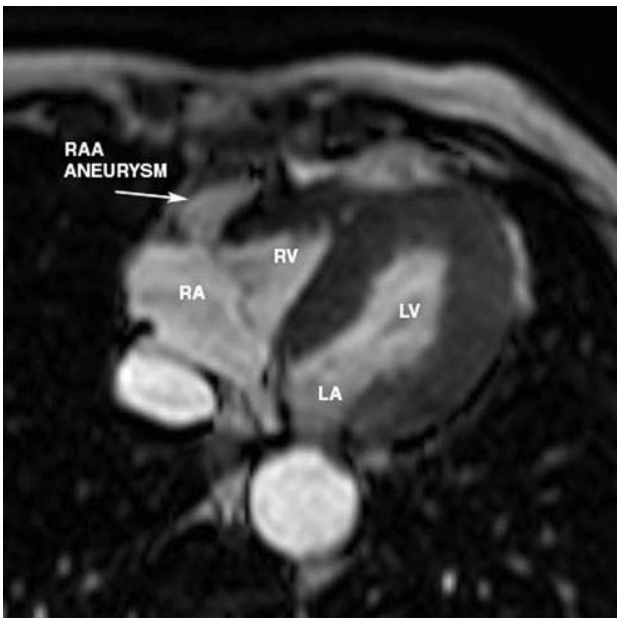

Figure 2. Cardiac magnetic resonance scan demonstrating a right atrial appendage aneurysm. LA: Left atrium; LV: Left ventricle; RA: Right atrium; RV: Right ventricle; RAA: Right atrial appendage aneurysm.

the right atrial appendage are very rare. The largest right atrial appendage aneurysm was reported to be 15 x 8.5 cm in size.[2]

In a review of 103 sporadic cases with congenital malformations of the right atrium and the coronary sinus published between 1955 and 1998, Binder et al.[6] documented 13 cases with associated malformations including hypertrophic cardiomyopathy, ventricular septal defect, bronchial malformation, hamartoma of the liver, and dilated urethropelvic system; of these, most associated congenital malformations were seen in patients with a coronary sinus diverticulum.[6] Association with atrial septal defect was also reported.[7] In our case, the right atrial appendage aneurysm coexisted with an abdominal aortic aneurysm.

Changes in clinical presentation depend on the type of malformation. Diffuse enlargement of the right atrium and right atrial diverticula are usually asymptomatic, and thus they are incidentally detected on a chest radiogram, or during echocardiographic evaluation. In our case, the right atrial diverticulum was not symptomatic. Multiple diverticula and coronary sinus diverticulum manifest with symptomatic tachycardia. It was reported that supraventricular tachycardia was more frequently seen in patients with a coronary sinus diverticulum because of posteroseptal location of accessory pathways.[8] The major rhythm abnormality was atrial fibrillation or atrial flutter seen in 28% of cases with congenital malformations of the right atrium and the coronary sinus.[6] Other conduction disturbances included preexcitation, junctional rhythm, atrioventricular block, and incessant supraventricular tachycardia.[6] On the other hand, large diverticula may give rise to jugular edema or hepatomegaly compressing intrapericardial cardiac structures.[6] Right atrial aneurysms may harbor a thrombus leading to pulmonary[9] or paradoxical systemic thromboembolism.[10] Binder et al.[6] reported 11 deaths that occurred in patients with right atrial (n=5) and coronary sinus (n=6) diverticula.

Diagnosis is made by TTE, TEE, and coronary sinus angiography. Magnetic resonance imaging and computed tomography play an important role in the differential diagnosis from a pericardial cyst or mediastinal tumor. In our case, diagnosis was made by TEE, and confirmed by cardiovascular MRI.

Treatment options depend on clinical presentation, and include anticoagulation, catheter ablation, and surgery. Surgical treatment can be considered in symptomatic cases and in patients with symptoms due to compression of large aneurysms. Follow-up with conservative treatment may be appropriate in most cases. Anticoagulation is crucial because of the increased risk of thrombus development in the right atrium.

REFERENCES

1. Yıldız Ö, Ütük O, Bayturan Ö, Tıkız H. Nadir görülen bir konjenital anomali sağ atriyal anevrizma: Olgu sunumu. MN Kardiyoloji 2006;13:126-8.
2. Guaricci AI, Tarantini G, Basso C, Corbetti F, Rubino M, Ieva R, et al. Images in cardiovascular medicine. Giant aneurysm of the right atrial appendage in a 39-year-old woman. Circulation 2007;115:e194-6.
3. Barberato SH, Barberato MF, Avila BM, Perretto S, Blume Ld Ldo R, Chamma Neto M. Aneurysm of the right atrial appendage. Arq Bras Cardiol 2002;78:236-41.
4. Kobza R, Oechslin E, Prêtre R, Kurz DJ, Jenni R. Enlargement of the right atrium-diverticulum or aneurysm? Eur J Echocardiogr 2003;4:223-5.
5. Jenni R, Goebel N, Schneider L, Krayenbühl HP. Idiopathic familial right atrial dilatation. Schweiz Med Wochenschr. 1981;111:1565-72. [Abstract]
6. Binder TM, Rosenhek R, Frank H, Gwechenberger M, Maurer G, Baumgartner H. Congenital malformations of the right atrium and the coronary sinus: an analysis based on 103 cases reported in the literature and two additional cases. Chest 2000;117:1740-8.
7. Yıldırım N, Gölbaşı Z. Echocardiographic diagnosis of a case with giant right atrial aneurysm. Echocardiography 2006;23:140-2.
8. Sheldon WC, Johnson CD, Favaloro RG. Idiopathic enlargement of the right atrium. Report of four cases. Am J Cardiol 1969;23:278-84.
9. Staubach P. Large right atrial aneurysm: rare cause of recurrent pulmonary embolism. Z Kardiol 1998;87:894-9. [Abstract]
10. Suedkamp M, Horst M, Mehlhorn U, Hoppe U, Arnold G, de Vivie ER. Surgical repair of right-atrial aneurysm. Thorac Cardiovasc Surg 2000;48:35-7.