Pseudoaneurysm of the native sinus of Valsalva

Tętniak rzekomy zatoki Valsalvy – opis przypadku

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Abstract

Pseudoaneurysm of the native sinus of Valsalva is exceedingly rare. We present a case of a 32-year-old male who was referred to the hospital after he had been symptomatic for 1.5 years. Transoesophageal echocardiography and computed tomography illustrated a pseudoaneurysm arising from the non-coronary sinus of Valsalva. A prompt operation was performed upon admission, and the patient recovered.

Key words: computed tomography, pseudoaneurysm, sinus of Valsalva

Kardiol Pol 2009; 67: 291-294

Pseudoaneurysm of the native sinus of Valsalva is exceedingly rare [1]. It may arise from any of the three sinuses of Valsalva, either spontaneously, or after trauma or infection [1-10].

Case report

A 32-year-old male was admitted due to lethargy, weakness and shortness of breath on exertion for 1.5 years with recent attenuation. Physical examinations revealed normal vital signs, with no pulmonary rales or heart murmurs audible. The heart had a moderate prominent left atrial contour on chest radiograph (Figure 1). Transoesophageal echocardiography showed mild-moderate aortic regurgitation, mild-moderate mitral regurgitation, and mild-moderate pulmonary hypertension with a pressure gradient of 42 mmHg, and a pseudoaneurysm originating from the non-coronary sinus of Valsalva, causing compression to the left ventricular outflow tract. Computed tomographic scans confirmed the pseudoaneurysmal formation from the non-coronary sinus of Valsalva (Figures 2 and 3). He had no history of chest blunt trauma. He had undergone mitral valve replacement in 1988 for rheumatic heart disease. He developed paroxysmal atrial fibrillation 10 years earlier, which was converted successfully to normal sinus rhythm by electrical cardioversion.

A prompt operation was performed upon admission. The preoperative diagnosis was confirmed intraoperatively. The aortic valve was moderately regurgitant. A pseudoaneurysm originated from the non-coronary sinus of Valsalva, 2 cm in diameter, bulging rightward and posteriorly, and compressing the left atrium and left ventricle. The orifice of the pseudoaneurysm was closed by interrupted pledget stitches, and the aortic valve was replaced with a 21-mm Sorin SL mechanical prosthesis (Sorin Biomedica Cardio, S.p.A., Via Crescentino snc, Saluggia, Italy). The cardiopulmonary bypass time was 78 min, and the crossclamp time was 72 min. He was discharged on the fourth postoperative day, and has done well since then.

Discussion

Pseudoaneurysm of the native sinus of Valsalva is exceedingly rare, and is much rarer than congenital aneurysms [1, 3]. Only 11 cases could be retrieved from the English literature [1-10]. In total, 12 cases including the present one have been described (Table I). Their formations were spontaneous in 5 cases (41.7%), traumatic in 3 (25%), and infective in 4 (33.3%). One of them had a ruptured pseudoaneurysm at onset. In four patients who had a spontaneous pseudoaneurysm of the sinus of Valsalva, it originated from the right or left coronary sinus. This is

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Received: 16 July 2008. **Accepted:** 23 July 2008.

the first case of spontaneous pseudoaneurysm of the sinus of Valsalva arising from the non-coronary sinus. Only one patient was older, while all others were younger than 70 years. Symptoms were not mentioned in 2 patients. In the remaining patients, 1 (10%) patient was asymptomatic, and the lesion was discovered during routine physical examination. Others presented infection (n = 3), dyspnoea, palpitation or shortness of breath (n = 3), chest pain (n = 2), infection plus chest pain (n = 1) or chest pain plus hemiparesis (n = 1). Compression of the coronary artery causing myocardial infarction occurred in 3 patients, in whom two pseudoaneurysms arose from the left and one from the right sinus of Valsalva. One patient had bicuspid aortic valve and aortic dilation manifesting with cardiogenic shock.

Non-invasive methods, such as echocardiography, computed tomography or magnetic resonance imaging, were used as diagnostic tools in 9 (75%), and combined non-invasive and invasive methods (angiography or aortography) in 3 (25%) patients. Pseudoaneurysms were located in the right, left and non-coronary sinus of Valsalva in 5 (41.7%), 4 (33.3%), and 3 (25%) cases, respectively. Their dimensions were 4.74 ± 2.73 (1-9.4) cm (n = 8). Treatments for these patients were not mentioned in 2 patients. One (10%) patient did not undergo surgery due to a poor condition. Nine (90%) patients had their pseudoaneurysms resected and sinuses of Valsalva repaired. Two patients were operated on an urgent basis. Two had a simultaneous aortic valve replacement, and two had an aortic root replacement or repair. Seven of these

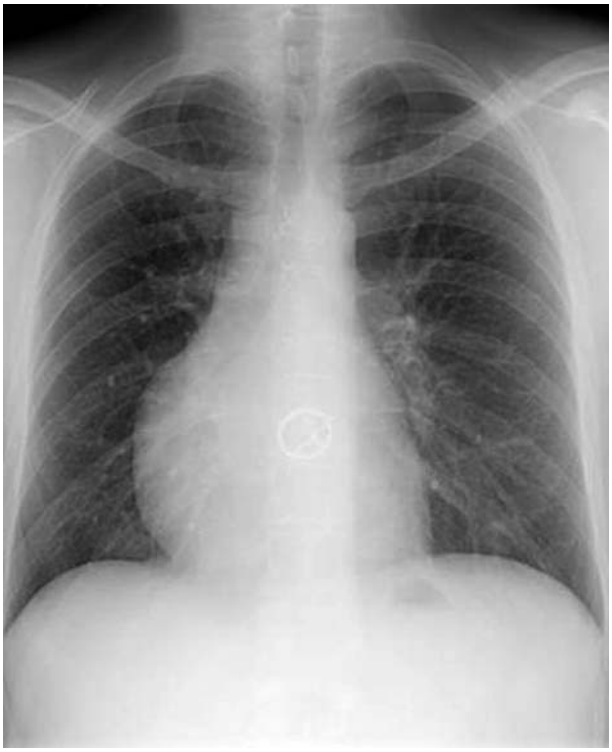

Figure 1. The heart had a moderate prominent left atrial contour on chest radiograph. The prosthetic valve in the mitral position could be noted

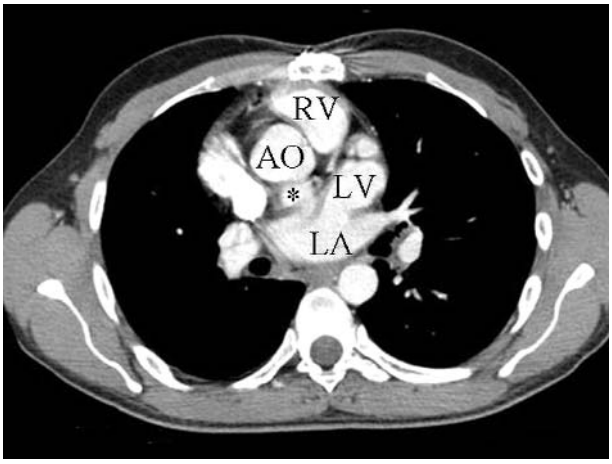

Figure 2. An axial view of the computed tomographic scan revealed a pseudoaneurysm (*) 2 cm in size arising from the posterior position of the aortic root

AO – aorta, LA – left atrium, LV – left ventricle, RV – right ventricle

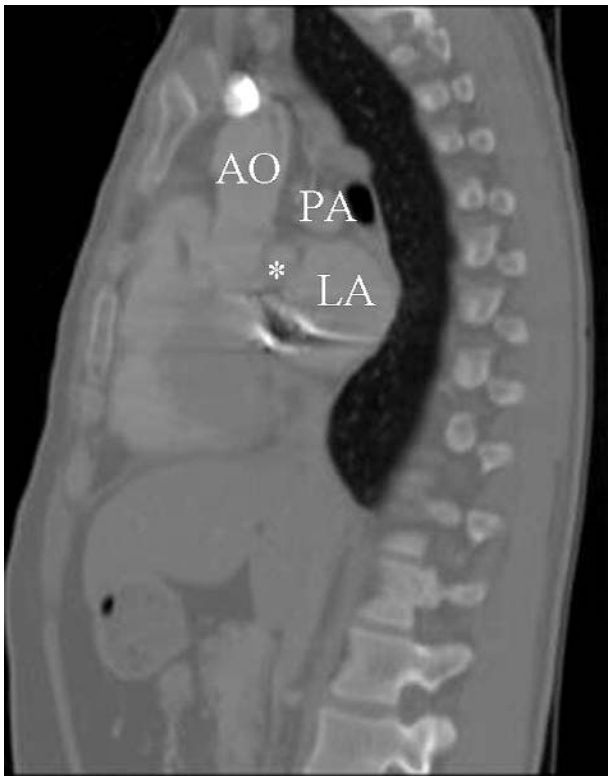

Figure 3. Computed tomographic scan in a sagittal view showed a pseudoaneurysm (*) 2 cm in size arising from the posterior position of the aortic root. The left atrium was dilated, extending posteriorly

AO – aorta, LA – left atrium, PA – pulmonary artery

Table I. Data from literature on pseudoaneurysms arising from the native sinus of Valsalva

Author	Year	Age	Gender	Nature	Symptom	Diagnostic method	Location in sinus of Valsalva	Size [cm]	Surgery	Clinical outcome
Misumi et al.	2001	77	f	spontaneous	asymptomatic, check-up for cardiomegaly	X-ray + echo + aortography	right	1	resection + sinus repair	alive
White and Plotnick	2001	44	f	traumatic	NG	echo + MRI	left	6	surgery	NG
White and Plotnick	2001	56	m	spontaneous	chest pain	CT	right	NG	NG	NG
Salanitri et al.	2005	33	m	mycotic	a history of pulmonary and pericardial *Aspergillus* infection	pathology + MRI	right	3.5	palliative care	NG
Lee et al.	1998	59	f	spontaneous (rupture)	exertional dyspnoea	echo + angiography	right	9.4 × 8.3	urgent resection + patch repair	alive
Katayama et al.	2005	55	f	postoperative	high fever + general fatigue	echo + CT	non-	4 × 4	urgent 2-staged operation resection + patch repair of non – coronary sinus	alive
Gharzuddine et al.	1997	38	m	traumatic	palpitations and a heart murmur, left coronary artery compression	echo	left	NG	sinus repair + coronary artery bypass + ASD closure	alive
Habib et al.	1998	69	f	traumatic	chest pain /left main compression	echo	left	7 × 6	aortic root replacement, left main coronary artery ligation, and arterial bypass	alive
Núñez et al.	2004	36	f	spontaneous	chest pain, aphasia, right hemiparesis	MRI + angiography	left	NG	AVR + sinus repair	alive
Kim et al.	2004	42	m	septic	paravalvular abscess	3D CT angiography	non-	NG	aortic root repair + sinus repair	NG
Cayla et al.	2006	25	m	septic/ mycotic	chest pain, fever/ compression of right coronary artery	CT	right	5 × 3	AVR + sinus repair	NG
present		32	m	spontaneous	lethargy, weakness and shortness of breath on exertion	echo, CT	non-	2	AVR + sinus repair	alive

patients survived the operation, while the outcomes of the remainder were not mentioned.

Histological studies demonstrated that structural weakness between the aortic wall and annulus might be responsible for the occurrence of sinus of Valsalva lesions [11]. Echocardiography, computed tomography and magnetic resonance imaging are valuable non-invasive diagnostic approaches [2]. Echocardiography may show a huge mass at the aortic root bulging into the right ventricular outflow tract, and an indirect sign such as a turbulent flow could be noted in Doppler colour flow imaging [4]. Both computed tomography and magnetic resonance imaging can show details of the pseudoaneurysms. Especially magnetic resonance imaging precisely displays size and location of the pseudoaneurysm, length and width of neck, size of thrombus, and relations with the adjacent tissues [5].

The indication for prompt surgery for pseudoaneurysms of the sinus of Valsalva is based on the risk of sudden rupture [4]. Infections confined to the leaflets may simply require a valve replacement, but extensive manoeuvre and further reconstruction would be necessary if the annulus and the surrounding tissues were encroached in septic cases [5].

Pseudoaneurysms of the native sinus of Valsalva may imply high morbidity in view of their tendency to rupture. A good outcome could be obtained by prompt diagnosis and surgery.

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