

## CATHETER INJURY: A PROBABLE CAUSE OF ANEURYSMAL POUCH ON NON-CORONARY CUSP

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**ABSTRACT** : Aneurysmal aortic pouch is quite a rare finding in echocardiographic examinations. We present a case with aneurysmal pouch on non-coronary cusp detected by both transthoracic and transesophageal echocardiography and confirmed by surgery. The lesion invaded the interventricular septum and required septal repair in addition to aortic valve replacement during surgery. We consider that catheter injury was the most likely aetiology for the aneurysmal aortic pouch because the patient had previously undergone left ventricular catheterization.

**Key Words:** Aneurysmal Aortic Pouch; Echocardiography; Catheter Injury.

### INTRODUCTION

Aneurysmal aortic pouch is quite a rare finding in clinical cardiology practice. Its diagnosis can be made by telecardiography, transthoracic and transesophageal echocardiography, aortic root angiography, computed tomography, and nuclear magnetic resonance. Since aortic valve structure is seriously destroyed, it usually needs surgical treatment. Severe aortic regurgitation, structural damage in the aortic valve leaflets and aortic annulus can be detected in patients with aneurysmal aortic valve pouch. In our study, we present a case with aneurysmal pouch on the non-coronary cusp, detected by both transthoracic and transesophageal echocardiography and confirmed by surgery, which invaded the interventricular septum and required septal repair in addition to aortic valve replacement during surgery.

### CASE STUDY

A 47-year-old male was admitted to our hospital for left heart failure. He had a history of aortic valve disease for more than 20 years. He was asymptomatic until the previous year when he experienced dizziness and was evaluated in another center. A left heart catheterization at that time revealed severe aortic regurgitation with normal coronary arteries. Any aneurysmal aortic pouch was not reported in the aortography and transthoracic echocardiography. Aortic valve replacement was not planned because his left ventricle was normal. After an electrophysiologic examination a permanent pacemaker was implanted for trifascicular block. His echocardiographic examination at that time was reported as a calcific aortic valve with severe aortic regurgitation and a 30 mmHg systolic gradient between aorta and left ventricle. His left ventricle dimensions were only mildly enlarged

(end diastolic diameter: 60 mm, end systolic diameter 45 mm).

He was completely asymptomatic for six months after pacemaker implantation but began to have exertional dyspnea from that time on. During the last month before his admission to our hospital, he developed fever, was hospitalized with the diagnosis of pneumonia and received some broad-spectrum antibiotics, but his dyspnea progressed. He was transferred to our hospital with symptoms and signs of frank left ventricular failure. After standard medical therapy for heart failure his condition stabilized promptly. Transthoracic and transesophageal echocardiography revealed a completely destroyed and calcific aortic valve. The aortic valve anatomy was greatly distorted and there was an aneurysmal pouch on the non-coronary cusp with an area of 2.99 cm<sup>2</sup> in diastole (Fig. 1). Severe aortic regurgitation was also detected. His left ventricle dimensions were prominently increased (end diastolic diameter 68 mm, end systolic diameter 51 mm).



Fig. 1: Transesophageal echocardiography showing an aneurysmal pouch on non-coronary aortic cusp (AO: aorta, LA: left atrium, LVOT: left ventricular outflow tract, RV: right ventricle).

In physical and laboratory evaluation there was no evidence for endocarditis at the time of his admission to our hospital. Although the presence of a vegetation was seriously considered, his echocardiographic evaluation was negative.

He was operated on the fifth day of his admission. During the operation the aortic cusps were severely calcific and the noncoronary cusp was found to be deviated towards the septum. When the cusps were teared to see the coronary ostiums, a pouch with dimensions of about 3x1.5 cm. was detected just below the noncoronary cusp extending to the septum and invading the septum making it thinner. After the excision of this pouch the septum had to be repaired with a patch and the aortic valve was replaced.

### DISCUSSION

Transesophageal echocardiography is a very sensitive technique for detecting aortic valve structure and function (1-3). It is an important guide for differential diagnosis in our case. We had suspicion of aortic aneurysmal pouch by transthoracic echocardiography, but it was confirmed by transesophageal echocardiography. Other techniques computed tomography and such as nuclear magnetic resonance were thought to be unnecessary and had their own risks due to the permanent pacemaker in our patient.

Aortic aneurysmal pouch could have developed due to three different reasons in our case: 1-previous rheumatic fever (as a late complication), 2-infective endocarditis, 3-catheter injury during the previous left ventricle catheterization. There was no evidence of endocarditis at the time of his admission to our hospital in the physical and laboratory evaluation. Also the postoperative pathologic examination of the valve revealed no evidence of endocarditis. Therefore we excluded the possibility of infective endocarditis. It is known that our case has had aortic valve disease for a long time. It is quite possible that he had an attack of rheumatic fever as a child, but there is no evidence of any recurrence of this attack and he is quite old for such a rheumatic fever recurrence. We think that catheter injury may have made a part of the aortic cusp weak and intolerant of diastolic pressure gradient, and a result, the weakened part of the aortic cusp progressively dilated into the left ventricular outflow tract forming an aneurysmal pouch. In our case, aneurysmal pouch on the noncoronary cusp also invaded the interventricular septum and required septal repair in addition to aortic valve replacement during surgery. To our knowledge in the literature there is only one other aneurysmal pouch reported (4).

In this case the aneurysmal pouch was on the left coronary cusp, and the authors could not decide whether the pouch was due to bacterial endocarditis or catheter injury (4).

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