SUMMARY: We present the case of a 42 years old patient from a poor social environment, with a mechanical aortic valve mono-disc prosthesis, implanted for an aortic stenosis, who presented with suspicion of an anaphylactic shock caused by local anaesthetics for tooth extraction. He was admitted to the emergency room with chest pain radiating to the back, loss of consciousness, arterial hypotension (90/60mm Hg), body temperature 37.7°C and shiver. The pain characteristics and the manner of onset created diagnostic problems (Anaphylaxis? Acute coronary syndrome? Thrombosis of the aortic prosthesis?), because the patient performed for 5 years hard physical work, smoked 20 cigarettes daily and suspended the entire medication including the oral anticoagulation.

The thorough echocardiographic examination was able to rapidly diagnose the dissecting aneurysm of the ascending aorta (De Bakey type II, Stanford A), with starting point in the paraseptal desinsertion of the mechanical aortic prosthesis with secondary paraprothetic regurgitation grade II.

The emergency thoracic CT angiography confirmed the limited dissection of the aortic arch, proximal to the emergence of the brachiocephalic trunk.

The patient was addressed to the heart surgeon with the diagnosis: Dissecting aneurysm of the ascending aorta. Desinsertion of the mechanical aortic valve prosthesis. Paraprothetic regurgitation grade I/II. Mitral and tricuspid valve insufficiency grade II. NYHA functional class II and underwent emergency heart surgery (Bentall De Bono)

Conclusions: The transthoracic echocardiography predicted accurately the diagnosis in a short time in this complex unstable cardiac surgical emergency case. Infective endocarditis, the most frequent cause of valvular prosthesis desinsertion, was excluded. The thoracic CT angiography offered concordant data on the case and completed the echocardiographic data by informations regarding the extension of the aortic aneurysm and dissection of the ascending aorta.

The mechanical aortic valve prosthesis implantation is a valuable therapeutic option when needed and seems to provide a long survival even in patients that do not respect physical effort, smoking or food restrictions. Stopping the oral anticoagulation treatment for 5 years interestingly did not alterate the function of the mechanical aortic valve prosthesis in this case. The trigger of the acute ascending aortic dissection was apparently the stomatologic stress, but in reality the desinsertion of the prosthesis.

Key Words: acute dissecting aneurysm of the ascending aorta, desinsertion of the mechanical aortic valve prosthesis, echocardiography, surgery
**INTRODUCTION**

Acute aortic regurgitation (AR) is a surgical emergency that requires appropriate diagnosis and rapid intervention for optimal outcomes. Because the examination findings of acute regurgitation are different and often more subtle than those of chronic regurgitation, the diagnosis it’s often missed when a patient presents with dyspnea and shock (7). As in chronic regurgitation, acute aortic regurgitation may be caused by malfunction of the valve (native or prosthetic) itself, by dilatation of the aortic root and annulus, or may be due to a combination of these factors (2, 3). Actually the leading cause of acute AR is endocarditis and prosthetic valve dysfunction for valvular etiology and aortic dissection due to atherosclerotic disease (1, 5). Understanding the mechanism leading to aortic regurgitation is essential for proper patient management, including the surgical approach.

Echocardiography is the principal tool for diagnosis and grading of acute AR severity as well as for serial follow-up. Two dimensional echocardiography (Echo2D) permits evaluation of LV size and function as well as visualization of valve structures and of the aorta (4). Color Doppler (CD) is a highly sensitive and specific technique for detecting AR and provides visualization of the regurgitant jet. Continuous and pulsed wave Doppler offer additional hemodynamic information and aid quantitation. The presence of severe AR and normal left ventricular size should immediately raise the possibility of acute AR. If a transthoracic study is inconclusive, particularly with prosthetic valve dysfunction and/or aortic dissection (type A) transesophageal echo may be indispensable in identifying the severity and mechanism of regurgitation. It’s known that CD on transthoracic echo may underestimate regurgitation severity, particularly if the jet is eccentric.

Cardiac catheterization is rarely needed in aortic dissection type A and to an unstable patient, and may worsen dissection.

Additional imaging to evaluate possible underlying causes of acute regurgitation, such as computed tomography or magnetic resonance imaging, may be needed, particularly if aortic dissection is a concern not addressed fully by echo (6).

A high index of clinical suspicion and echo are important in rapid diagnosis of all causes of acute AR, and surgical treatment should proceed as quickly as possible. Surgical mortality remains high; however, medical therapy is not sufficiently effective to obviate the need for surgery.

**A RARE CLINICAL CASE**

We report the case of a 42 year old patient from a village of the district of Timis, from a poor social environment, that was addressed by the Lugoj Municipal Hospital to the County Emergency Hospital Timişoara with the suspicion of an anaphylactic shock caused by local anesthetics for tooth extraction. The patient
presented with chest pain, loss of consciousness, arterial hypotension (90/60 mm Hg) and shiver. In the ER of Lugoj he was treated with Dopamine (1 vial), Cortisol hemisuccinate 400 mg, Glucose 5% 500 ml and Saline solution 9% 1500 ml.

The patient arrived in the ER of the County Emergency Hospital Timişoara on the 29.07.2008 at 00:30 in poor general condition, with chest pain radiating to the back, dizziness and nausea. The clinical examination revealed BP 80/50 mm Hg, with no difference between the right and the left arm, regular and rhythmic heart sounds, normal prosthetic heart valve sound, normal pulmonary auscultation, bilaterally palpable dorsalis pedis artery pulse and body temperature 37.7°C.

The medical history revealed that in 1992 the patient was operated for aortic stenosis with valve replacement by mechanic mono-disc Sorin 23 prosthesis. In the last 5 years he lefted the country to work abroad on a building site. He performed hard physical work, smoked 20 cigarettes daily and suspended the entire medication including the oral anticoagulation. The patient had 3 medical reports with him. One of them revealed that in 1999 he was referred to the Psychiatric Hospital Gătaia with the diagnosis “Borderline personality disorder” and the second attested that in the same year he was hospitalized at Municipal hospital Lugoj for: “Escherichia coli pyelonephritis. Beta hemolytic streptococcal pharyngo-amygdalitis. NYHA functional class II. Mechanical aortic prosthesis. Chronic oral anticoagulant treatment”. The last medical report from the year 2000, released by the ASCAR clinic, registered that he was hospitalized for dental extraction and prophylaxis against infective endocarditis. The physical examination reported prosthetic heart valve sound, normal chest X-ray and laboratory tests. ECG showed normal sinus rhythm, left ventricular hypertrophy with repolarization abnormalities.

The treatment included Digoxin 0.25 mg od, Furosemide 40 mg tab qod, Aspocardin (potassium and magnesium aspartate) 2 tabs daily and Trombostop (acenocumarolum) every other day one tab.

The patient was admitted to the Cardiology department of the County Emergency Hospital Timişoara at 1:30 am. with suspected acute coronary syndrome, asymptomatic, with no fever, normal sinus rhythm, regular pulse 70 bpm, present prosthetic heart valve sound, BP 100/50 mmHg.

The ECG showed sinus rhythm, left ventricular hypertrophy with slight ST segment depressions in V4-V6 (Figure 1).

The chest X ray showed a moderate left ventricular cardiomegaly with dilated ascending aorta and a mechanical heart valve prosthesis; peribronchovascular interstitial thickening and moderate central pulmonary stasis (Figure 2).

Laboratory examinations confirmed the absence of an oral anticoagulation treatment: INR 0.97, aPTT 27/s and showed normal values (CK-MB 21 U/L, total CK 194 U/L, ALT 36 U/L, Hb 13.7g/L, HCT 40%, Leucocytes 13300/mm3, Thrombocytes 124000/mm3, BUN 17mg%, Creatinine 0.96mg%, Glucose 146mg%, Sodium 137mg%, Potassium 3.4mg%).

The patient was treated by the physician on night duty with heparine infusion 1000U/h, Sintrom (Acenocumarol) 3mg, Bisoprolol 2.5 mg and Furosemide 40mg p.o.

The second day in the morning, 9h after admission to the hospital:

Physical examination: asymptomatic patient, with no fever, BP 105/70mm Hg with no difference between the right and the left arm, regular and rhythmic heart sounds, 70bpm, normal prosthetic heart valve sound, absent pulmonary stasis.
ECG: normal sinus rhythm, 75bpm, left QRS axis deviation, left ventricular hypertrophy with ST segment depressions of 1-2mm in DI and V3-V6, rare atrial extrasystoles.

Laboratory examinations: aPTT 65.2/s, Leucocytes 9690/mm3, Hb=13.4g/L, HCT 39%, CK- MB 47U/L, CK 246U/L, AST 45U/L, ALT 18U/L, Cholesterol 154mg/dl, Total Lipids 494mg/dl, Triglycerides 57 mg%, HDL=73mg%, Direct Bilirubin 0.57mg%, BUN 26 mg%, Creatinine 1.05mg%, Uric acid 4.4mg%, аGT 45 U/L, Serum Amylase 35U/L, ESR 4mm/h, Blood Iron 46ig%, Fibrinogen 349mg%

Transsthoracic echocardiography: aneurismal dilatation of the ascending aorta with double lumen, and a diameter of 7-8cm at the emergence in the parasternal long-axis view as well as in the apical five chamber view, occupying space of the right and left atrium.

Color Doppler records a turbulent flow from the true lumen to the false lumen close to the aortic valve prosthesis. Mechanical aortic disc valve prosthesis with inferior desinsertion with periprosthetic regurgitation II degree. Mitral valve with diastolic fluttering and central mitral regurgitation grade II. Left ventricle wall thickness

Fig.1. The ECG recorded in the ER (A) and 9 h later (B)

Fig.2 The chest X ray recorded at the beginning of the Angio-CT

ECG: normal sinus rhythm, 75bpm, left QRS axis deviation, left ventricular hypertrophy with ST segment depressions of 1-2mm in DI and V3-V6, rare atrial extrasystoles.
1.4cm, DTD 5.8cm, DTS 4.2cm, EF 0.60. Tricuspid regurgitation grade II. All echocardiographic examination were performed with an Acuson Sequoia C 512 machine.

Fig. 3 Two dimensional Echocardiography and color Doppler examination in apical four chamber view (A, B, C) and parasternal long axis view (D). It is obviously a marked dilatation of the ascending aorta (8.2cm) with compressive effect of the right and left atrium. (A) The diastolic recording shows left ventricular filling from a severe compressed left atrium by the dilated aorta. (B) The same apical four chamber view shows in systole a small turbulent flow of mitral regurgitation and a turbulent flow at the level of one of the pulmonary vein probably also compressed. (C) From the apical view tilting the transducer, one can see how the aorta compresses the right atrium also and a small tricuspid regurgitation flow is seen in systole.

Fig. 4 Apical four chamber view shows in systole (A) mitral and tricuspid regurgitation, in diastole (B) the filling of the two ventricles and in both figures an aneurismal dilatation of the aorta with severe compression of the two atria.
Thoracic CT angiography. Aneurysm of the ascending aorta with an approximate diameter of 8.8 centimeters from the level of the mechanical aortic valve prosthesis insertion to the level of the aortic arch, with intraparietal hematoma and an intima fold limited to the anterior aortic wall that arises above the emergence of the right coronary artery and is seen over 5 cm length. The aneurysm compressed the right and the left atrium and the right pulmonary veins.

Fig.5 Echo 2D images from apical five chamber view (A, B) and four chamber view (C, D). In systole (A) appears an echo-transparent zone medial of the mono disc aortic valve prosthesis which is determined by its desinsertion. The image of the disc of the valve prosthesis with its posterior shadow cone, and the dilated aorta which "occupies" an important space of both atriums are also visualized. In diastole (B) the pathologic movement of the valve prosthesis hides the desinsertion zone. (C, D) show in the center the image of the dilated aorta, and just beneath the interventricular septum a linear echogenic structure that seems to belong to the desinserted valve prosthesis.

Fig.6 Paraprosthetic aortic regurgitation seen in the apical five chambers view in proto (A) as well as in mesodiastole (B)

Fig.7 Parasternal long axis view in diastole (A) and in systole (B) shows severe dilatation of the aortic root (8.5cm), eccentric ventricular hypertrophy (diastolic wall thickness 1.4cm, DTS 4.4cm), second degree mitral regurgitation, paraprosthetic aortic regurgitation and turbulent intraaortic flow from the true lumen to the false one.
Fig. 8 (A). ECO M shows dissection of the ascending aorta: double lumen suggested by the paralell aortic wall echoes with a big separation in space, visible anterior as well as posterior. (B). Suprasternal view of the ascending aorta with double lumen up to the level of the aortic arch.

Fig. 9 Parasagittal MIP 3D Reconstruction shows (A). the aneurysm of the ascending aorta up to the level of the left brachiocephalic trunk and the dissection fold (seen as a linear filling defect), with better view in the sagittal plane (B). The frontal view (C) visualizes the aneurysm of the ascending aorta that begins at the level of the mechanical aortic valve prosthesis, the latter being seen as an intense opaque structure from which the intima fold begins. (D) Parasagittal MIP 3D Reconstruction in axial plane reveals the dilated ascending aorta that severely compresses the left atrium and shows the dissection fold and the mechanical aortic valve prosthesis.
The aortic arch has a diameter of 3.15 cm proximal to the emergence of the brachiocephalic trunk. The descending aorta has normal aspect.

The diagnosis set on the clinical examination and on the paraclinical tests was:

- Dissecting aneurysm of the ascending aorta.
- Desinsertion of the mechanical aortic valve prosthesis.
- Paraprothetic regurgitation grade I/II.
- Mitral valve insufficiency grade II.
- Tricuspid valve insufficiency grade II.
- NYHA functional Class II.

The diagnosis was confirmed few hours later by the findings of cardiac surgery.

**Cardiac surgery.** Bentall De Bono operation involving composite graft replacement of the aortic valve, aortic root and ascending aorta (Vascutek conduct, Dacron 26mm, with St. Jude double disc mechanical prosthesis Nr. 23 mm insertion), with re-implantation of the left coronary artery into the graft. Myocardial revascularization by coronary artery bypass graft with saphenous vein on the right coronary artery.

The patient was dismissed from the heart surgery department after 10 days being surgically cured. He was reassessed after 1 and 3 months. The echocardiographic examination revealed 3 months after surgery a normal physiological functioning St Jude mechanical aortic valve prosthesis and a normal prosthetic ascending aorta of 3.3 cm diameter, left ventricular hypertrophy with diastolic wall thickness of 1.4 cm, DTD 6.2 cm, DTS 4.1 cm, FS 31%, EF 61% and persistent II degree mitral and tricuspid regurgitation.

**CONCLUSIONS**

1. The thorough transthoracic echocardiography set an accurate diagnosis in a short time in this complex unstable cardiac surgical emergency case.
2. The thoracic CT angiography offered concordant data on the case and completed the echocardiographic data by informations regarding the extension of the aortic aneurysm and dissection of the ascending aorta.

3. The mechanical aortic valve prosthesis implantation is a valuable therapeutic option when needed and seems to provide a long survival even in patients that do not respect physical effort, smoking or food restrictions.

4. Stopping the oral anticoagulation treatment for 5 years interestingly did not lead to colmatation of the mechanical aortic valve prosthesis in this case.

5. The trigger of the acute ascending aortic dissection was apparently the stomatologic stress, but in reality the desinsertion of the prosthesis.

6. Infective endocarditis, the most frequent cause of valvular prosthesis desinsertation, was excluded.

REFERENCES


