Case report

Aorto-right ventricular fistula : a rare and severe complication in a young patient with double localization of infective endocarditis (case report with review of literature)

ABSTRACT

Abstract: Aorto-right ventricular fistulas are defects of the aortic wall in the area above the right coronary cusp, where it separates aorta and right ventricular outflow tract. This entity is rare and exceptional. Often, these defects are due to trauma or infective endocarditis.
We report an occasional finding of such a fistula with dramatic issue, in young patient without past medical history which admitted for rupture of cerebral mycotic aneurysm secondary to infective endocarditis with double localization (aortic and pulmonary valve).

Keys word: Infective endocarditis, fistula, aortic, pulmonary.

Introduction: Infective endocarditis (IE) is a serious and complex disease with high morbidity and mortality. If the aortic valve is a relatively common site for IE, the pulmonary valve is a rare site often view in patient with intracardiac device and intravenous toxicomania habitus. Heart failure, perivalvular extension and embolic events are well-known complications of IE. By contrast, the aorticocavitary fistula is extremely rare in EI of aortic localization and less on double localization. We report the role for clinical imaging in a case with natives aortic and pulmonary valve endocarditis complicated by fistula aorticocavitary with fatal issue.

Patient and observation:

A 25 years old male patient had no medical history, without a concept of drug addicts admitted to emergencies with global left hemiplegia revealing a broken right sylvian aneurysm (**Fig 1**). Patient was taken care of by the neurosurgery team with a successful aneurysm cure. Therefore, he was admitted in postchirurgical intensive care unit where he was put under respirator and positive inotropic support. On the first postoperative day, he

developped fever with highlighting of Staphylococcus aureus and he was treated according to the EI protocol.

On the clinic examination, the interrogation was impossible, he was found febrile, he had a tattoo on the left arm. Blood pressure was at 100/50 mmhg, a pulse on 64 bpm. Auscultation found harsh holodiastolic aortic murmur with associated diastolic pulmonary murmur and glow of B2 with signs of heart failure.

Electrocardiogramm noted a sinus rhythm with the first degree atrioventricular block at 360 ms, the ample and positive T waves on precordial derivations. (**Fig 2**)

In terms of Biological examination : Leucocytes at 7,5 giga/l; hemoglobin at 13,3 g/dl; Platelet at 320 giga/l; inflammatory syndrome with C reactive protein and procalcitonine elevated; a good kidney and liver function.

Transthoracic echocardiogramm (Fig 3) made in the patient's bed showed compatile appearance of infective endocarditis in the native aortic and pulmonary valves complicated by aortical-right ventricular fistula on the right outflow.

Aortic valve was tricuspide, redesigned and little thickened, the analysis found a severe aortic regurgitation and presence of an echogenic nodular tissue measuring 5 x 6 cm on the non coronary cusp, a abcess on the right side of valsalva sinus and mitroaortic curtain. The parasternal grand axe view showed some defect at 5 mm between aortic root (right side of vasalva sinus) and right ventricular. The parasternal little axe view showed the same defect.

The analysis of pulmonary valve on the parasternal little view showed a reworked, mutilated and perfored valve siege of severe pulmonary regurgitation with presence of multiple echogenic s nodular tissue of wich the most important measured 9 x 6 mm et 6 x 7 mm on the pulmonary and right outflow sites.

Mitral valve was a little remorked, with vegetation imaging, with moderated mital regurgitation.

Left ventricular was dilated (TDD/TSD : 66/48 mm), with good systolic fonction, dilatation of two atrium, filling pressure were normal.
Right ventricular was not dilated with a good function.

The evolution was quickly unfavorable over death, making it impossible the realization of transoesophageal echography

Discussion :

Infective endocarditis is seen with annual incidence around 30 cases per million individuals per year in population-based studies performed in western countries [1,2]. In Africa and more precisely in Morocco, there is no national registry for IE, doen't allow us to have date about incidence [1,2]. Aortic valve is involved in more than half of the cases of valvular endocarditis. The IE of native pulmonary is extremely rare [1].

Aortic valve is a relatively common site for infective endocarditis (IE) in the contrast with IE of pulmonary valve whose have often like complication the pulmonary embolism or the right heart failure. Aortic valve endocarditis can get complicated by spread of infection to the adjacent structures or peri-annular tissue causing aortic root abscess, ventricular septal defect, pseudoaneurysm, atrioventricular block, heart failure and developpement of aortico cavitary fistula. The periannular extension is a dreaded complication with high morbidity and mortality [1-3].

The extension of sepsis to nearby structures is seen as a complication in 10-40% cases of aortic valve endocarditis. The aorta communicating to adjacent chambers seen in 1.5-2.2% cases of aortic IE [4]. Early rapid and accurate diagnosis of native aortic and pulmonary valve endocarditis is essential to appropriately treat and manage the complications. Imaging is one of important modality to diagnose the complication of IE in addition to contribution in basic diagnosis. Serial clinical evaluation and tailored imaging is important in monitoring the case of IE and early detection of the complication [1,2]. In this case, the Transthoracic echocardiogram (TTE) was sufficient for diagnosis. TEE is the first line imaging for diagnosis of IE. Infective endocarditis with complication and periannular extension can be better evaluated by transesophageal echocardiogram [1-3]. TEE has a sensitivity and specificity of 80% and 95% against a sensitivity of 57% of transthoracic echocardiography (TTE) [1,2]. In the clinically suspected cases where TTE has not yielded a clue, TEE is the next line of evaluation. Unfortunately, in this case, we could not realize TEE. IE associated with aortico right ventricle is frequently associated with aortic regurgitation [5]. The Aortico RV fistula has one of continous flow unlike unlike aortic left ventricular fistula (ACF) [4]. The localization in the pulmonary valve could be explain by extension of aortic valve after aneurysm rupture. Our case was admitted initially as a neurological presentation, the diagnosis of IE was laid late avec probably cardiogenic shock depending by inotropic support

with double severe aortic and pulmonary regurgitation. The abcess on mitroaortic curtain explained the first Av block. A detailed imaging fully incorporating the clinical status of the patient is essential for early detection of the disease and its complications [6,7]. Persistence of fever and symptoms, new onset murmur and heart failure, development of heart block should prompt for repeat imaging to identify the complication. Serial evaluation with dedicated imaging and comparing with previous information can help immensely in this regard. Non response to medical therapy and deterioration was the reason to search for possible complications in the second case which came as IE with eccentric AR. Cardiac gated computed tomographic angiogram (CTA) has found recognition for diagnosis of IE with complication. Abscess, Pseudoaneurysm and aortico cavitary fistula are better delineated with CTA. Cardiac CTA has found recommendations in the IE guidelines. CT angiogram complements the transesophageal echocardiogram for diagnosis and management of infective [1,2, 6].

Conclusion: A case is reported of a patient who developed a double localization (aortic and pulmonary native valve) of infective endocarditis, in whom a fistula developed from the right coronary sinus of Valsalva to the right ventricle. The prognosis is poor if the diagnosis is late. The diagnosis must be suspected quickly on clinical status and the imaging (TTE or TEE) could laid diagnosis; which will allow adequate care. The patient was deaded.

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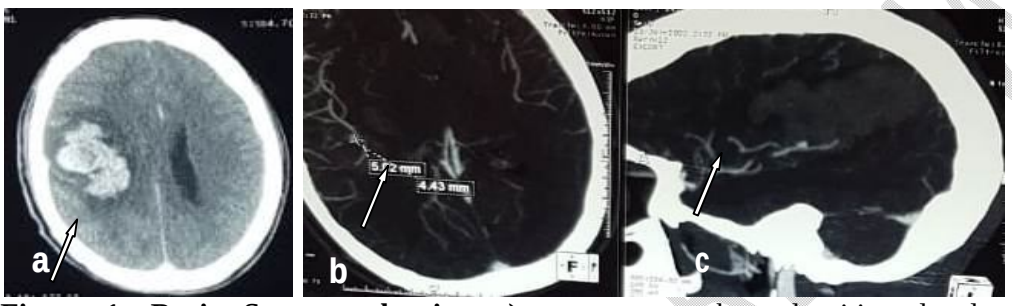

Figure 1: Brain Scanner showing a): spontaneous hyperdensitis related to cerebral hemorrhage (white arrow); **b) Sylvian aneurysm** (white arrow) **c)** Passage of contrast indicating Sylvian aneurysm rupture (white arrow)

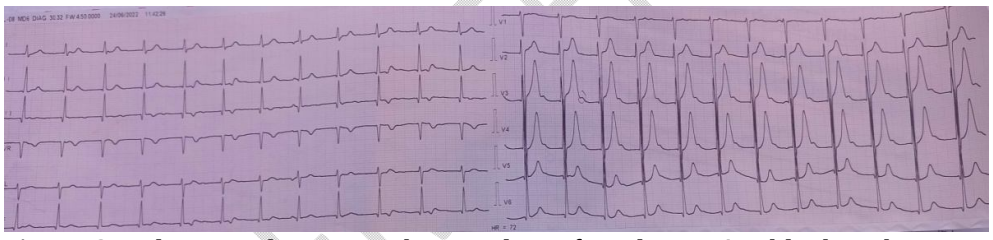

Figure 2: Electrocardiogramm showing large first degree AV block with positive and ample T waves on precordial derivations

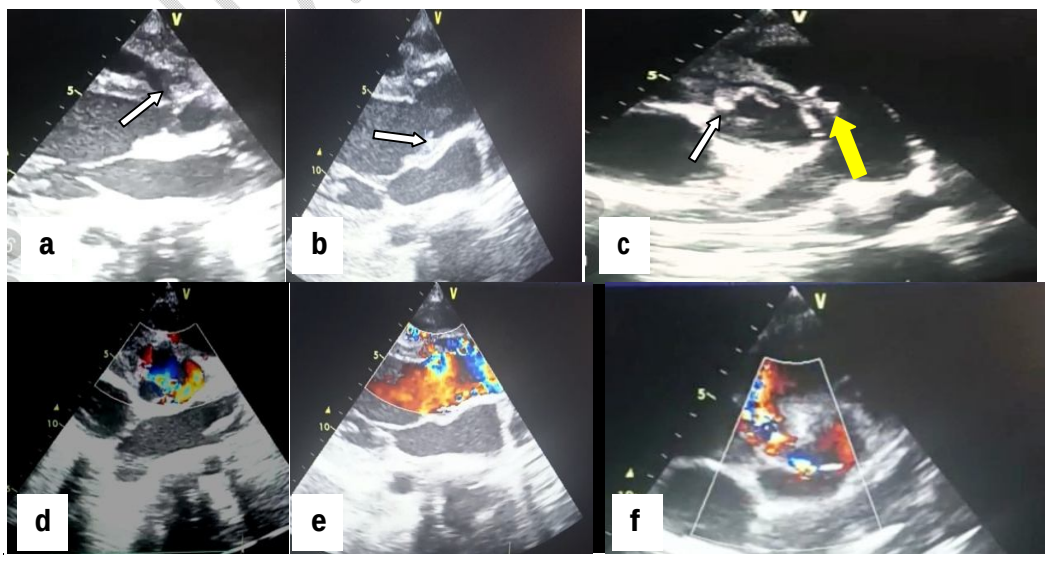

Figure 3: Transthoracic echography: a) Left parasternal long axis with Breach (white arrow) between aorta and right ventricular with irregular shoreline related a large fistula**; b)**Aortomitral curtain (White arrow); **c**): Mutilated pulmonary valve with vegetation (large white arrow); Large abcess in pulmonary outflow in contact with breach (small white arrow); **d) and e):** Severe aortic regurgitation; **f):**Flow passage between the aorta and pulmonary tract.