

Morbid Cardiac Lesional Association Promoting an Acute Ischemia of Pelvic Member by Paradoxal Emboly

Magaye Gaye^{1*}, Mouhamed Lèye², Papa Salmane Ba¹, Adama Sawadogo¹, Momar Dioum², Ndèye Fatou Sow¹, Papa Adama Dieng¹, Momar Sokhna Diop¹, Souleymane Diatta¹, Assane Ndiaye¹, Amadou Gabriel Ciss¹, Mouhamadou Ndiaye¹

¹Thoracic and Cardiovascular Surgery Department - FANN CHNU

²Medical Cardiology - FANN CHNU

*Corresponding author

Kalyani Raghuvanshi

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Abstract: We report a clinical case of paradoxical embolism in a 22 years old female patient who has been admitted in hospital with acute left lower limb ischemia. In her previous medical history, 3 times early-miscarriage was noticed. While investigating for etiologies, Trans Thoracic Echocardiogram was prescribed and it showed an association which favorate a distal embolism: atrial septal defect (ASD) with right-to-left shunt, thrombus in the right atrium and severe pulmonary stenosis. We performed embolectomy and the patient was transferred to the cardiology unity for pulmonary dilatation before performing open ASD open repair later.

Keywords: Paradoxical embolism – acute ischemia – patent ovalis foramen – stenosis.

INTRODUCTION

Paradoxical embolism (PE) is most often defined as the passage of a thrombus from the venous circulation to the arterial circulation through a patent foramen ovale (PFO) [1]. In young patients, PFO is often reported as the cause of transient ischemic stroke (TIA) or cerebrovascular disease (CVA) [2], but is rarely incriminated in peripheral vascular ischemia [3]. We report a case of acute ischemia of the left lower limb by paradoxical embolism in a 22-year-old patient with inter-atrial communication (AIC) and pulmonary stenosis.

CASE REPORT

Mrs OD is a 22-year-old patient with a history of 3 early spontaneous abortions, in whom an anti-phospholipid syndrome was evoked without an antibody test confirming the diagnosis.

She was hospitalized for 3 months in cardiology, in another hospital, for tight pulmonary valve stenosis with systolic dysfunction of the right ventricle, right atrial and right ventricular thrombus associated with multiple venous thrombosis: extensive thrombosis of the left lower limb and thrombosis of the venous trunk brachio-cephalic right extended to the right jugular. The electrocardiogram showed extreme sinus tachycardia at 125 beats per minute and right ventricular hypertrophy. CT angiography showed no pulmonary embolism. Since then, she has been taking furosemide, captopril and acenocoumarol.

She was received urgently in our service for acute pain of the left foot back to the leg. The foot was oedematous with cyanosis at the hallux and the 2nd left toe. The clinical examination found a acute ischemia of the left lower limb marked by a disappearance of all

pulse and coldness of the limb. At the cardiac examination, there was a systolic murmur at the pulmonary focus. The right lower limb as well and the rest of the physical exam was unremarkable.

In the biology, there was no anemia or leukocytosis, the prothrombin rate was 36.1% with an INR 2.05, the TCA is normal and the platelet count was 300 000/mm³. CT angiography of the aorta and arteries of the lower extremities could not be done. A surgical exploration was decided.

An approach of the left common femoral artery (CFA) and a transverse arteriotomy at 5mm of the bifurcation was performed. The CFA was completely thrombosed. Thrombectomy with the Fogarty probe had removed multiple fibrino-cruroric thrombi of different ages (Figure 1). The latter had a good flow of CFA and a reflux of the superficial femoral artery (SFA) and the deep femoral artery (DFA) after intervention. The operative follow-up on the vascular plane was marked by satisfactory revascularization of the left lower limb.

But on day 6 postoperative, the persistence and worsening of desaturation, at 76% ambient air, indicated the completion of a new cardiac echocardiogram that confirmed tight pulmonary valve stenosis with a right ventricular gradient. Pulmonary artery at 93 mm Hg (Figure 2). There was dilatation of the right cavities with preserved right ventricular systolic function, moderate tricuspid insufficiency, thrombus in the right atrium at the origin of the superior cava vein (Figure 3), and wide anterior atrial communication (CIA). Ostium secundum of 24 mm in diameter with an exclusive right-left shunt (Figure 4). The ejection fraction of the left ventricle was 40%.

The patient was transferred to cardiology where medical treatment was continued. The consequences were favorable afterwards and the patient left the hospital after 1 month of hospitalization. Pulmonary dilatation is planned in cardiology before considering surgical closure of the CIA.



Fig-1: Fibrino-cruroric emboli of different ages

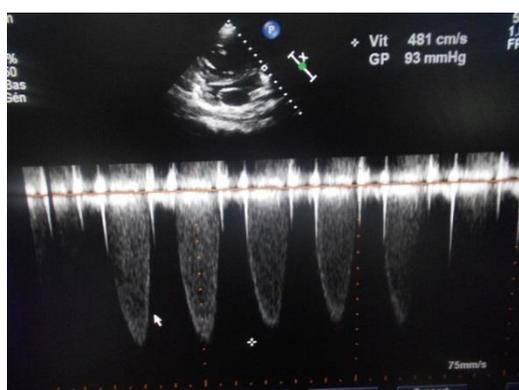


Fig-2: tight pulmonary stenosis with GM 93 mm Hg



Fig-3: Right intra-auricular thrombus

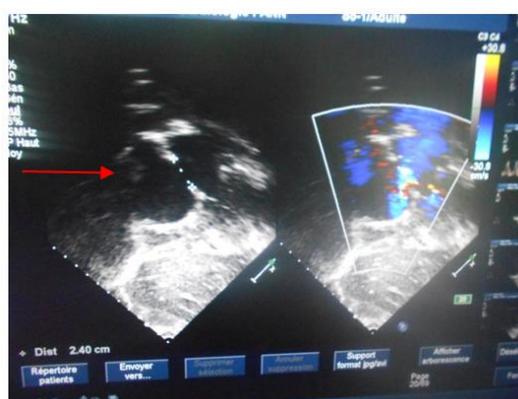


Fig-4: Inter auricular communication with shunt right - left

DISCUSSION

The paradoxical embolism was described for the first time by Cohnheim in 1877 [1] who traced the course of an embol through a cardiac septal defect. It accounts for less than 2% of all arterial emboli [4]. The etiological diagnosis could not be made at the consultation of our patient. Indeed the diagnosis of PE is difficult because presumptive. The observation of a thrombus straddling the interatrial septum is a coincidence. In order to facilitate the etiological presumption in front of a distal ischemia, Meister [5] proposed 4 diagnostic criteria: an unexplained embolism in an arterial territory, a focal venous thrombosis (excluding pulmonary veins), an intracardiac septal defect and a right shunt - left. Thus our patient fulfilled all these 4 criteria and the diagnosis was retained without any doubt. In clinical practice, diagnosis is facilitated by the development of trans-esophageal echocardiography, which is 3-fold more effective than trans-thoracic ultrasound in the detection of both intracardiac thrombi and shunt [6].

As with our patient, other authors have reported the association of CIA and severe pulmonary stenosis [7,8]. Under these conditions, the risk of paradoxical embolism is increased because of pulmonary hyperpressure reversing the CIA shunt and

orienting the embol to the aortic bed [8]. The elevation of the pulmonary pressure gradient associated with the restriction of the ostium secundum would be the cause of an inadequate mixing of the blood, expressing an absence of cyanosis as in our patient.

Paradoxical embolism in the arteries of the lower extremities is very rare. According to Juglar *et al.* [9] this localization represents 25% of cases of PE far behind the cerebral localization which would be 37 to 50% of cases. In our patient as in most studies [1, 3, 10, 11], the embolus were fibrino-cruoric. Nevertheless, fatty, gaseous or amniotic emboli are described [9].

Thrombotic disease is not common in young patients. In our patient the anti-phospholipid antibody syndrome has been evoked as the source of thrombosis. On the one hand, it is difficult to be formal in the absence of a specific antibody assay. On the other hand, the sources of thrombosis are varied and may even be unusual and unexpected [12].

The extent of embolism outside the left femoral location could not be fully developed. The clinic excluded cerebral and abdominal visceral localizations. Chest angioscan had excluded pulmonary embolism before the occurrence of acute ischemia of the left lower limb. This absence of pulmonary embolism can be explained by the pulmonary stenosis that seems to protect the pulmonary arterial bed. The decreased systolic function of the left ventricle seen in our patient is often associated with coronary embolism and indicates coronarography or coro-CT [7, 12].

CONCLUSION

Paradoxical embolism represents a small proportion of the etiologies of lower limb ischemia. Nevertheless, a heart disease associating a CIA, a pulmonary stenosis and a thrombosis of the right atrium constitutes an association at risk very favorable to the occurrence of an embolism on the aortic bed.

CONFLICTS OF INTEREST

The authors state that there are no conflicts of interest.

CONTRIBUTION OF AUTHORS

All the authors cited contributed to the writing of this work.

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