

Case Report

Idiopathic Rupture of the Anterolateral Papillary Muscle

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Introduction

Papillary Muscle Rupture (PMR) is a rare and often life threatening complication which is frequently subsequent to a myocardial infarction or an active endocarditis [1,2]. Severe mitral valve regurgitation, cardiogenic shock and pulmonary edema are the acute consequences of PMR. We report our experience with a spontaneous papillary muscle rupture which is of neither an ischemic origin nor a known etiology.

Case Report

A 77-year-old woman with no medical history of known coronary artery disease presented to the emergency department with acute chest pain. A 12-lead electrocardiogram showed no sign of ischemia (Figure 1). Laboratory investigation demonstrated a hemoglobin of 135 g/L, platelets count was normal, white blood cell count of 12 G/l. The troponin level was twice the normal value and the D-dimer was normal. In addition, cultures of urine, blood, and sputum were negative. She quickly showed hemodynamic instability spurring on intubation and admission in the Intensive Care Unit. A transthoracic echocardiogram (Figure 2) identified an anterior papillary muscle rupture with severe mitral regurgitation (Figure 3) due to a flail anterior mitral valve leaflet. There was no sign of left ventricular dyskinesia.



Figure1: EKG with no sign of acute ischemia.

Trans-esophageal echocardiography confirmed the diagnosis of PMR with the mobile stump of the ruptured papillary muscle head swinging between the left ventricle and the atrium (Figure 2). A cardiac catheterization was performed, demonstrating angiographically normal coronary arteries and severe mitral regurgitation (Figure 4). The patient was rapidly taken to the operating room and underwent a mitral valve replacement with a St. Jude Epic biological valve. The Cardiopulmonary Bypass (CPB) lasts 61 min with a clamping time of 43 min. Pathology excluded a hyper-eosinophilic syndrome of the PMR. Infectious investigations were negative and all cultures were sterile. The patient went to rehabilitation center 10 days later with a normal prosthetic valve function.

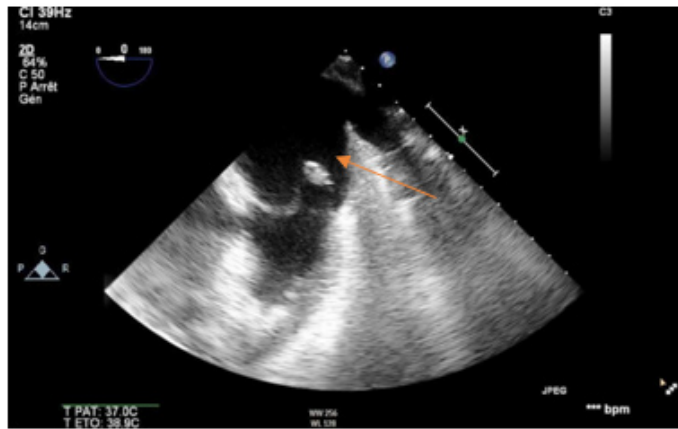


Figure 2: Transthoracic echocardiogram identified the anterolateral papillary muscle rupture with the swinging head stump during the cardiac cycle.

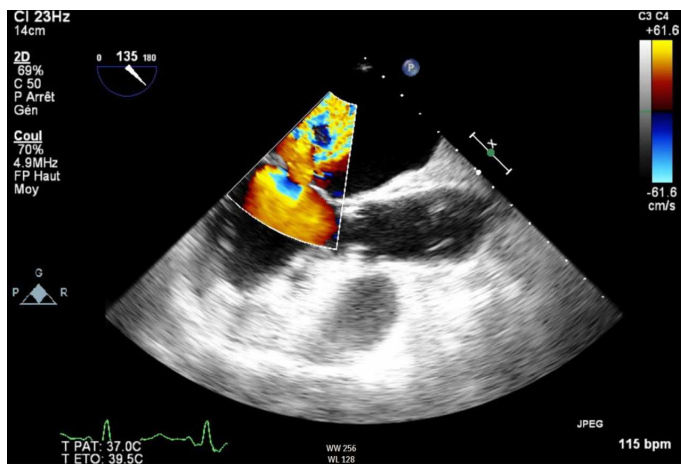


Figure 3



Figure 4: Normal coronary arteries.

Discussion

Papillary muscle rupture is a life-threatening emergency that is highly associated with acute myocardial ischemia. PMR is responsible for approximately 5% of death and rupture occurs within 2-7 days after myocardial infarction [3]. Spontaneous non-ischemic papillary muscle rupture is a much rarer cause and could be due to myocarditis, Ehler-Danlos syndrome, an infectious cause, Takotsubo cardiomyopathy, or mitral ring calcification, hyper-eosinophilic syndrome, and of traumatic origin [4]. Once the necessary investigations are done and are not conclusive of any mentioned etiologies, idiopathic spontaneous papillary muscle rupture should be considered. Prompt surgery with replacement of the mitral valve has been shown to considerably improve the survival rate [5]. Pathology of the head stump is fundamental to annihilate an ischemic origin or a hypereosinophilic syndrome [6].

Though transthoracic echocardiography is an excellent tool for detection and estimation of the severity of mitral regurgitation, it has limitations for detailed exploration of the subvalvular apparatus of the mitral valve. Hence, severe mitral regurgitation due to papillary muscle rupture is best confirmed by the trans-gastric view of Trans-Esophageal Echocardiography (TEE). Prognosis is favorable with early surgical intervention and prompt diagnosis of the underlying cause of papillary rupture is very important [5,7]. In our case, myocardial ischemia was discarded with a normal angiogram and the known mentioned non ischemic etiologies were all excluded. Hence, we concluded on an idiopathic rupture of the anterolateral papillary muscle. Gouda P et al highlighted about 37% of PMR of unknown or idiopathic origin in their review [8]. One possible explanation of the spontaneous rupture might be an excess of mechanical strain on the papillary muscle as stipulated by Fiore et al [7].

Conclusion

Idiopathic Spontaneous Papillary muscle rupture is a rare cause of PMR and should be considered when all other etiologies have been nullified.

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