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Ventricular Tachycardia Revealing a Rare Coronary-Cameral Fistula in a Structurally Normal Heart: A Case Report

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AUTHOR AND AFFILIATION

BENSALAH SALMA[1], BEDY OUMAR[1], OUTAHAYOU AMINA[1], BELHARTY NALJAE[1], HILAL SAFAE[2], FELLAT IBTISSAM[2], CHERTI MOHAMED[1]

[1] Cardiology B department, IBN SINA University hospital center, Mohammed V University, Rabat, Morocco.

[2] Rythmology department, Mohammed V University, Rabat, Morocco.

ABSTRACT

Coronary-cameral fistulas (CCFs) are uncommon coronary abnormalities, either congenital or, less commonly , acquired, involving an atypical connection between a coronary artery and one of the heart chambers. They are usually asymptomatic and discovered incidentally, but large fistulas may cause myocardial ischemia, volume overload, or arrhythmias. We will discuss the case of a 37-year-old male patient with no cardiovascular risk factors, admitted to our department for evaluation of palpitations. The 12-lead electrocardiogram (ECG) revealed an irregular, wide-complex tachycardia suggestive of ventricular tachycardia (VT). The patient underwent pharmacological cardioversion with amiodarone, resulting in prompt restoration of sinus rhythm. A comprehensive diagnostic workup, including transthoracic echocardiography (TTE), cardiac magnetic resonance imaging (MRI), and Holter monitoring, was unremarkable, showing no evidence of structural heart disease or myocardial scarring. Subsequent coronary angiography demonstrated a rare coronary–cameral fistula arising from the distal circumflex artery and draining into the left atrium. The patient was managed with antiarrhythmic therapy with close rhythm follow-up. This case highlights the unusual presentation of coronary-cameral fistula with VT in a structurally normal heart.

KEYWORDS

Coronary Cameral fistula, ventricular tachycardia, coronary angiography

MAIN ARTICLE

INTRODUCTION:

Coronary-cameral fistulas are rare congenital or, less commonly, acquired coronary anomalies characterized by abnormal communication between a coronary artery and a cardiac chamber. Most fistulas are small, hemodynamically insignificant, and discovered incidentally, However, large or strategically located fistulas may lead to myocardial ischemia, volume overload, or arrhythmias. Symptomatic presentations in young adults with structurally normal hearts are particularly uncommon.

In this article we present a rare case of a coronary-cameral fistula revealed by ventricular tachycardia in a 37-year-old male patient with no prior cardiovascular history.

CASE PRESENTATION:

A 37-year-old man with no known cardiovascular risk factors or significant past medical history presented to the hospital with palpitations. On examination, he was alert and hemodynamically stable, with a regular pulse rate of 200 beats per minute and a blood pressure of 120/60 mmHg. Cardiac auscultation was unremarkable, and no murmurs were detected.

The 12-lead electrocardiogram demonstrated an irregular wide-complex tachycardia consistent with ventricular tachycardia. The patient received intravenous amiodarone, which successfully converted the rhythm to sinus.

Routine laboratory tests including cardiac biomarkers, electrolytes, and thyroid function tests, were within normal limits. Transthoracic echocardiography revealed preserved left ventricular ejection fraction without regional wall motion abnormalities or structural defects.

Coronary angiography demonstrated smooth, unobstructed coronary arteries and identified a coronary–cameral fistula originating from the distal circumflex artery and draining into the left atrium.

Cardiac magnetic resonance imaging was normal, showing no structural or functional abnormalities.

Holter monitoring performed during follow-up revealed no recurrence of arrhythmia. The patient was discharged on oral amiodarone and a beta-blocker with close clinical and rhythm monitoring.

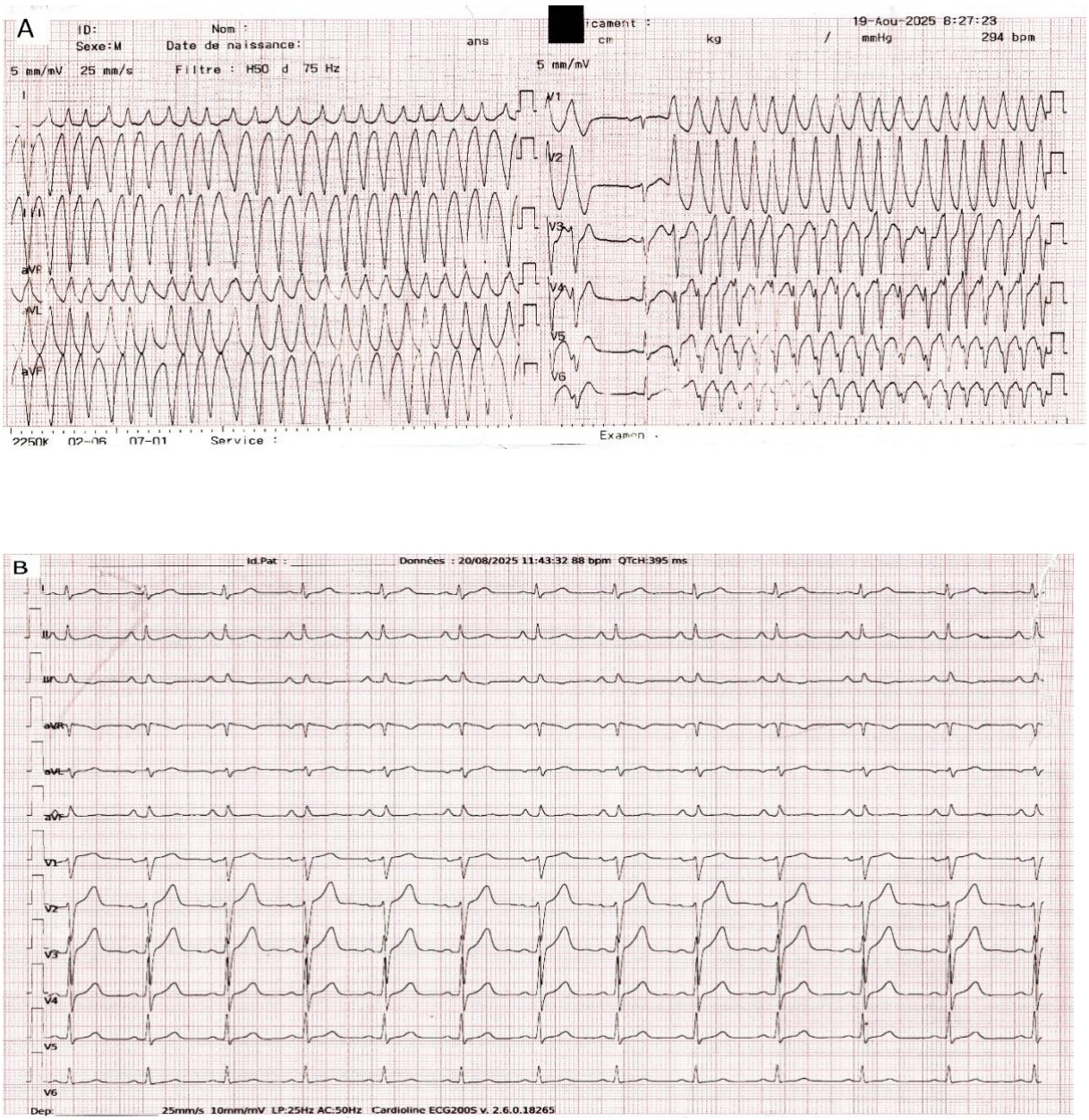

Figure 1: (A) 12 leads ECG showing irregular wide complex tachycardia consistent with ventricular tachycardia, **(B)** sinus rhythm after pharmacological cardioversion with amiodarone

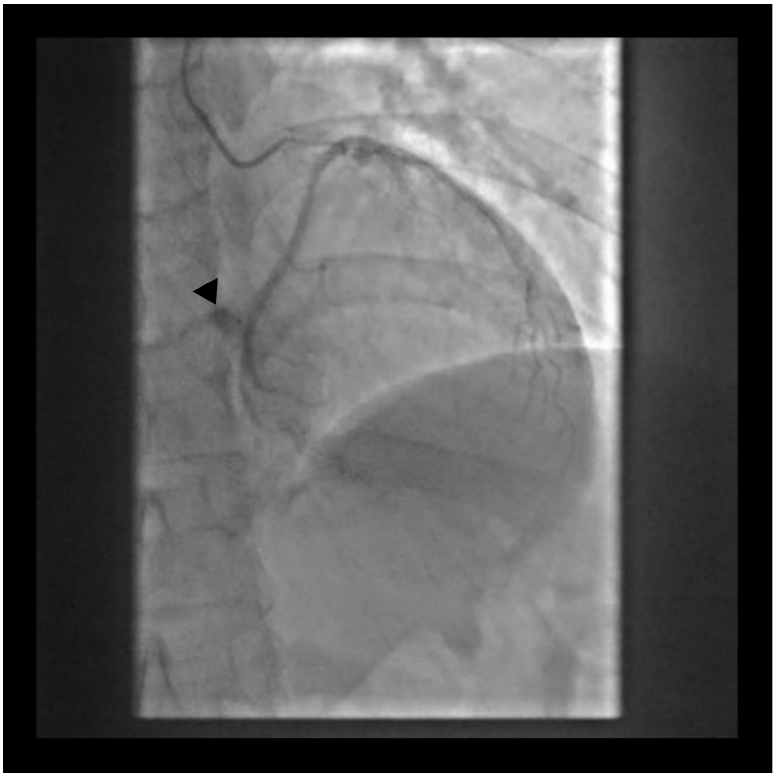

Figure 2 : coronary angiography in the Right Anterior Oblique (RAO) caudal view showing the coronary cameral fistula (arrow)

DISCUSSION

The incidence of coronary artery fistulas is rare with some studies reporting a prevalence of less than 1%. Said et al. found that 69% of unilateral fistulas originated from the left coronary artery (LCA), while 31% arose from the right coronary artery (RCA). Among fistulas originating from the LCA, approximately 29% were traced to the left circumflex artery (LCx). Interestingly, only 4% of LCx-originating fistulas drained into the left ventricle, whereas the majority (81%) terminated in the pulmonary artery, right atrium, or right ventricle.[1]

The majority of patients with coronary-cameral fistulas (CCFs) remain asymptomatic. Among those who do present with symptoms, chest pain and heart failure are the most common manifestations, whereas arrhythmias are rarely observed. A review of coronary

artery fistulas reported that 55% of patients were asymptomatic, 34% experienced angina, and 13% presented with heart failure [2].

Normally, blood flows along the path of least resistance. However, when a coronary-cameral fistula drains into a left-sided cardiac chamber, it creates a left-to-left shunt that can resemble aortic regurgitation, leading to volume overload of the left ventricle [3]. In contrast, fistulas draining into the right heart chambers follow the lower-resistance pulmonary circulation. A large fistula can divert blood away from normal coronary flow, causing widened pulse pressure, demand-induced ischemia, and left ventricular dysfunction, which may serve as a substrate for ventricular arrhythmias. Previous reports have described exercise-induced ventricular arrhythmias resolving after surgical ligation of the fistula [4], as well as atrial fibrillation associated with multiple coronary-cameral fistulas that improved with medical therapy including amiodarone and subsequent metoprolol [5].

Two-dimensional Doppler echocardiography is highly valuable for detecting dilation of the affected coronary arteries, while color flow mapping serves as a useful tool to identify the site of drainage. However, precise anatomical characterization of the fistula can be challenging with this modality.

Cardiac computed tomography (CT) and magnetic resonance imaging (MRI) provide excellent anatomical detail and are particularly valuable for preoperative planning [6, 7]. Nonetheless, coronary angiography continues to be the gold standard for the definitive diagnosis and thorough anatomical evaluation of coronary artery fistulas, offering precise information regarding the fistula's size, trajectory, and drainage site [6, 8].

For symptomatic patients with large coronary-cameral fistulas, treatment may involve either surgical ligation or percutaneous transcatheter closure. While surgical closure remains the most definitive approach, both strategies generally result in favorable outcomes. Continuing antiplatelet therapy after fistula closure is recommended [9, 10]. Beta-blockers have also been used in patients whose fistulas are not suitable for surgical intervention, particularly in those presenting with arrhythmias [11].

CONCLUSION

Coronary-cameral fistulas are a relatively rare subset of coronary artery fistulas. Most remain asymptomatic, particularly when small, whereas larger fistulas may be symptomatic.

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