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Research Article

Left But Not Right Ventricular Abnormal Doppler Waves

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ABSTRACT

The presence of a normal atrial electrical activity together with the absence of mechanical atrial activity has been reported after successful cardioversion and is named atrial stunning. In this observation, we report the existence of left but not right atrial stunning.

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Introduction

A 70 years old patient was referred to the Echolab for transthoracic echocardiography (TTE) on December 2018 the 21st. His past medical history included persistent atrial fibrillation and dyslipidemia. Past ECG revealed atrial fibrillation with a ventricular rate of 90/min, and no ST-T alteration. Because, he complained of mild dyspnea (class II), a strategy focused on rhythm-control was proposed and he underwent successful electrical cardioversion on December 2018 the 20th. His actual treatment includes apixaban 5mg BID, amiodarone 200mg SID and rosuvastatine 10 mg SID. TTE showed normal ventricular dimension and ejection fraction, no significant valvular regurgitation. Pulsed doppler analysis tricuspid and mitral patterns are presented on (Figure 1), pulsed tricuspid and mitral annulus Doppler Tissue Imaging (DTI) on (Figure 2). An ECG was performed immediately after the echo and showed normal sinus rhythm.

Discussion

The atria contribute up to 30% of left ventricular filling and cardiac output, and its mechanical activity is represented by the A wave on doppler inflow [1]. Several studies have shown a dissociation between

normal electrical activity and a transient atrium and atrial appendage mechanical dysfunction after successful cardioversion; this phenomenon is named mechanical stunning. It may occur up to 30-80% after conversion of atrial fibrillation, immediately after the cardioversion, and improves progressively over time with complete resolution generally observed within weeks [2]. Increased atrial dimensions and prolonged duration of atrial fibrillation worsen the severity and duration of mechanical stunning in contrary to reduced left ventricular ejection fraction [2-4]. Tachycardia-induced atrial cardiomyopathy, cytosolic calcium accumulation, and atrial hibernation are the suggested mechanisms of atrial stunning [3].

Our observation is singular as we report normal ECGH together with normal right atria mechanical activity, and the absence of left atrial mechanical activity after cardioversion, suggesting a left but not right atria mechanical stunning. This has been only exceptionally reported and is attributed to a lower pressure/volume overload of the right atria when compared to the left during atrial fibrillation and thus less structural alterations in the right atria [5]. The rare normalization of right mechanical activity together with persistent left atrial stunning may explain the occurrence of pulmonary edema after successful cardioversion.

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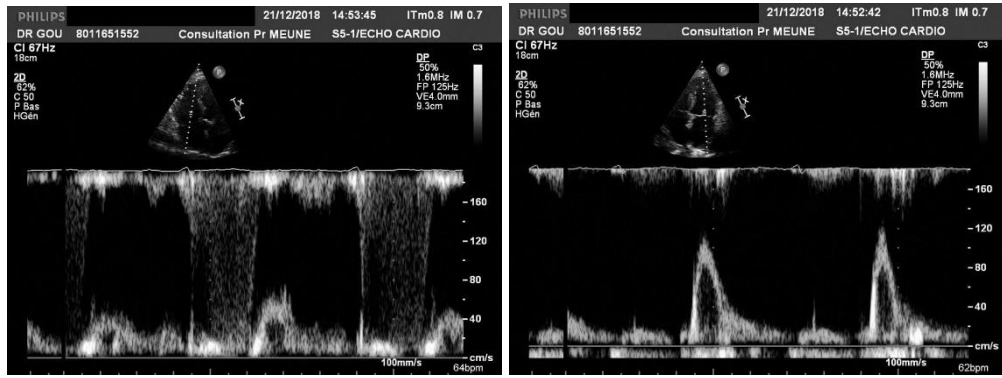


Figure 1: Pulsed Doppler analysis tricuspid and mitral patterns.

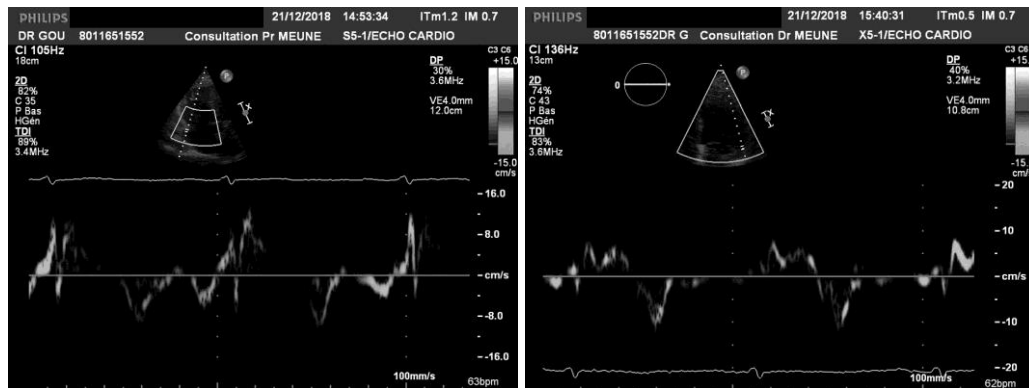


Figure 2: Pulsed tricuspid and mitral annulus Doppler Tissue Imaging (DTI).

REFERENCES

1. Fatkin D, Kuchar DL, Thorburn CW (1994) Transesophageal echocardiography before and during direct current cardioversion of atrial fibrillation: evidence for "atrial stunning" as a mechanism of thromboembolic complications. *J Am Coll Cardiol* 23: 307-316. [Crossref]
2. Harjai KJ, Mobarek SK, Cheirif J (1997) Clinical variables affecting recovery of left atrial mechanical function after cardioversion from atrial fibrillation. *J Am Coll Cardiol* 30: 481-486. [Crossref]
3. Khan IA (2003) Atrial stunning: basics and clinical considerations. *Int J Cardiol* 92: 113-128. [Crossref]
4. Manning WJ, Silverman DI, Katz SE, Riley MF, Come PC (1994) Impaired left atrial mechanical function after cardioversion: relation to the duration of atrial fibrillation. *J Am Coll Cardiol* 23: 1535-1540. [Crossref]
5. Lehmann G, Horcher J, Dennig K, Plewan A, Ulm K, Alt E (2002) Atrial mechanical performance after internal and external cardioversion of atrial fibrillation: an echocardiographic study. *Chest* 121: 13-18. [Crossref]