Research Paper

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Chronic Hypertensive Patient With Atrial Fibrillation Had Refractory Dyspnea And Fever, Mitral Valvular Vegetations Were Culprit.

Medical Science

KEYWORDS : Heart Failure , fever , Mitral valve vegetations, 2D Echo with Tissue Doppler .

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ABSTRACT

A 65-year-old man was reffered to our Cardiology Department with refractory dyspnea and fever. He had a long history of hypertension and chronic atrial fibrillation. 2D Echocardiography showed a large and mobile mitral valve vegetation, prolapsing into the left ventricular inflow tract with mitral regurgitation . Mitral regurgitation was hemodynamically significant and a moderate-to-severe pulmonary hypertension was observed.Tissue Doppler Imaging recorded at the level of the vegetation detected its incoherent motion and measured the peak antegrade velocity. Blood cultures were negative for both aerobic and anaerobic microbes. Diagnosis of fungal endocarditis was made and a treatment with fluconazole was started. In our patient echocardiography played a key role for a better definition of the clinical course. In this context, Tissue Doppler Imaging might provide an adjunctive parameter for the prediction of embolic risk from endocardial vegetations: the peak antegrade velocity recorded at the level of the vegetation.

Introduction

Fungal endocarditis is predominantly associated with several host predisposing conditions, for example intravenous drug addiction, indwelling foreign bodies (catheters, prosthetic valves, pacemakers or prosthetic joints), immunosuppression (solid organ/ stem cell transplantation, chemotherapy and HIV), prolonged use of broad-spectrum antibiotics, and different chronic underlying diseases (diabetes mellitus and malnutrition). In the majority of cases, Candida endocarditis is healthcare-associated, whereas Aspergillus endocarditis mostly occurs after cardiac surgery. Clinical presentation of patients with fungal endocarditis is highly variable: unspecific symptoms vary from fever and dyspnoea to chest pressure and asthenia. Febrile illness in combination with new cardiac murmur or signs of acute or chronic heart failure is highly suspicious of endocarditis. However, clinicians should be aware of severe embolic complications as the first and only symptom of fungal endocarditis. Fatal vascular embolisms range from ophthalmic manifestations, sectional infarctions in different organs and occlusions of extremities' arteries to cerebral embolism and haemorrhage.

Case Report

A 65-year-old man was reffered to our centre with refractory dyspnea and fever. He had a long history of hypertension and chronic atrial fibrillation.Electrocardiogram showed an atrial fibrillation with normal intraventricular conduction and a controlled ventricular rate (heart rate 74 bpm).Chest X-rays revealed cardiomegaly with bilateral hilar congestion. Blood tests documented neutrophilic leukocytosis (white blood cells 23,650/ml) and high levels of N-terminal prohormone of brain natriuretic peptide (NT-proBNP; 10,540 pg/ml), inflammatory markers (ESR 54 mm and C-reactive protein 19.2 mg/dl) and procalcitonin (0.21 ng/ml). Transthoracic echocardiography detected a Two large vegetation,16 mm and 13 mm in length, with the same consistency as the myocardial echoes, with a small area of attachment to the atrial side of the lateral mitral valve annulus and with a rapid oscillating motion, prolapsing into the left ventricular inflow tract, and completely different to the surrounding tissue. [Figure 1].

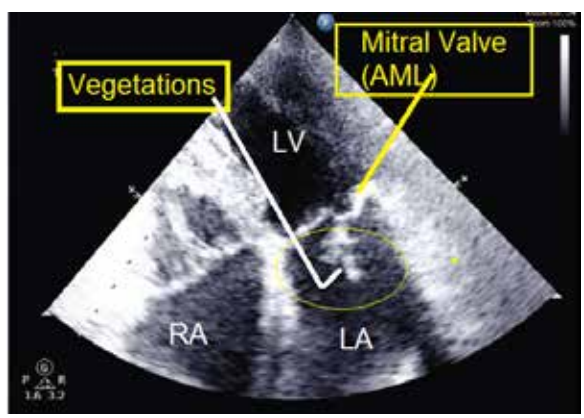

Figure 1: Transthoracic echocardiogram in the acute phase. Four apical chamber section. Two large vegetation with echogenicity similar to that of the myocardium and with a small area of attachment to the atrial side of the lateral mitral valve annulus.

It was associated with a severe mitral regurgitation due to a perforation in the posterior leaflet. A moderate tricuspid regurgitation, a significant caval venous congestion, and a moderate pulmonary hypertension, with a systolic pulmonary artery pressure (PAPs) value of 58 mmHg, were diagnosed too. The left ventricle was hypertrophic (interventricular septum thickness 12.5 mm), had reduced endocavitary dimensions (end diastolic volume 27 ml/m 2) and a slightly depressed global contractile function (ejection fraction, calculated using Simpson's method monoplane, was 45%).Tissue Doppler Imaging (TDI) was performed simultaneously; placing the pulsed wave (PW) sample volume at the level of the mass, it detected its incoherent motion, a rapid irregular movement unrelated to the cardiac cycle or cardiac structures as a result of free oscillation, with a prolapse in the left ventricular inflow tract. Furthermore, PW-TDI precisely characterized the vegetation mobility, by measuring a peak antegrade velocity of 40 cm/s [Figure 2], almost four times higher than the one obtained placing the sample volume at the level of the lateral mitral valve annulus.

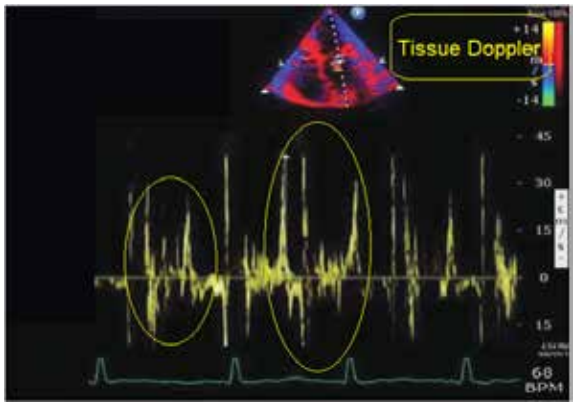

Figure 2: Pattern of pulsed wave-Tissue Doppler Imaging (PW-TDI) recorded at the level of the endocardial vegetation in the acute phase. Four apical chamber section. The vegetation exhibited a pattern of incoherent motion: an oscillatory movement, rapid and independent from the surrounding tissue, not related to the cardiac cycle. It was measured a peak antegrade velocity of 40 cm/s, about four times higher than that obtained at the lateral mitral annulus

Three subsequent blood cultures were found to be negative for both aerobic and anaerobic microbes.The patient was initially treated with intravenous (IV) diuretics (furosemide 60 mg/day), then underwent antibiotic therapy with IV vancomycin (1.5 g/day) and ceftriaxone (2 g/day), and suspected of having a fungal endocarditis, antifungal therapy with IV fluconazole (300 mg/day to 100 mg/day).In the following days of hospitalization, the patient developed a sudden onset of left hemiplegia. magnetic resonance imaging (MRI) demonstrated multiple hyperintense lesions involving both hemispheres, suggestive of a cardioembolism which were recovered after 7 days.Ongoing echocardiograms revealed a gradual decrease in the size of the mitral vegetation and an increase in its echo intensity [Figure 3A]; a concomitant reduction in its mobility was assessed by PW-TDI [Figure 3B]. However, a significant hemodynamically mild to moderate mitral regurgitation persisted.He was discharged at moderate conditions at his own request.He used to come at our cardiac OPD every 7 days on follow up. Finally after 3 months he became completely afebrile.

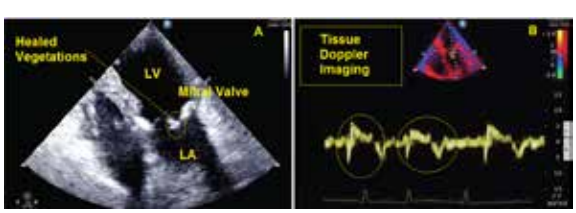

Figure 3A: Transthoracic echocardiogram performed after 2 weeks of intravenous antifungal therapy with fluconazole Four apical chamber section. Reduction in the size and healed vegetation. Figure 3B: Pattern of PW-TDI obtained at the level of the mass after 2 weeks ,Significant reduction in motility of the vegetation (peak antegrade velocity of 8 cm/s).avenous antifungal therapy with fluconazole

Discussion

Over the decade, an increase in cases caused by non-albicans species of Candida and other fungi like Fusarium solani, Lodderomyces elongisporus and Exophiala dermatitidis was reported. They were treated individually in case-by-case approaches, lacking randomized controlled trials and, mostly, treatment recommendations. Neurologic events occur in 20-40% of patients with infective endocarditis (IE), mainly through the embolic occlusion of cerebral arteries arising from endocardial vegetation. Echocardiography plays a key role in predicting embolic events. Several factors are associated with increased risk of embolism: Vegetation size: patients with vegetation length >10 mm are at higher risk of embolism, and this risk is even higher in patients with very large (>15 mm) and mobile vegetations; Vegetation mobility: from fixed to prolapsing; Vegetation consistency: calcified lesions do not have embolic potentiality; those with a consistency equal or inferior to that of myocardial echoes are associated with increased risk of embolic complications; Vegetation extent: involvement of a single valve leaflet (particularly the location on the mitral valve) or multiple valve leaflets, the extension to extravalvular structures; The increasing or decreasing size of the vegetation under antibiotic therapy; Particular microorganisms (Staphylococci , *Streptococcus bovis* , Candida spp.);Previous embolism; Biological markers.

In the present case, clinical features of the patient (old and weakened), negative blood cultures, the vegetation's large size, and the response to antifungal therapy with IV fluconazole, suggested a diagnosis of fungal endocarditis.The risk of embolization in cases of fungal endocarditis is very high; in fact, many authors recommend early surgical intervention in this situation to avoid neurological complications. PW-TDI is an echocardiographic technique, introduced by Isaaz *et al.*, and Mc-Dicken *et al.*, in the early 1990s, with a high temporal resolution.It permits to obtain high-quality Doppler signals and a rapid quantitation of velocity, acceleration, and displacement of different ventricular wall segments. Moreover, PW-TDI is able to discriminate the fine movements of intracardiac masses, and in particular, to identify endocardial vegetations by their characteristic pattern of incoherent motion. This pattern is due to the free oscillation of an anomalous structure, with velocity and direction of movement independent from and completely different than the surrounding tissue and without any correlation to the cardiac cycle. Although PW-TDI suffers from some limitations (the need for manually performed mapping; a limited spatial resolution; identification of anomalous structures may be difficult due to the superimposed color), in our opinion these critical cautions should not decrease its potential utility in clinical practice.

In our case, placing the PW-TDI sample volume at the level of the mitral valve vegetation, made it possible to precisely measure its motility, by means of the peak antegrade velocity: This was found to be about four times higher than that sampled at the lateral mitral annulus. Despite the absence of standardized criteria of increased velocity in the clinical practice, we hypothesize that PW-TDI might provide an adjunctive echocardiographic parameter for prediction of embolic risk in IE: the peak antegrade velocity recorded at the level of the vegetation. However, before being adopted in clinical setting, this parameter should be validated by adequately powered prospective studies.

Conclusion

Fungal endocarditis remains a rare disease occurring mostly in patients with predisposing host conditions. Regarding its poor prognosis because of severe complications, there is an urgent need for properly established treatment guidelines and prophylaxis for patients at risk. 2D Echocardiography with Tissue Doppler and blood culture are diagnostic tools.Current treatment recommendations on fungal endocarditis should distinguish between different groups of patients regarding the choice of a suitable empiric therapeutic regimen.The therapeutic regimen has to be adjusted to the detected pathogen. Targeted and monitored antifungal therapy is required in order to minimize side-effects and optimize treatment success.

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