

## **Isolated right ventricular thrombus with the severe chronic obstructive pulmonary disease- Case report**

**Introduction:** Right ventricular thrombus (RVT) is a life-threatening disorder that is rare and likely underdiagnosed. Multiple risk factors have been found, including younger age, prior bleeding events, congestive heart failure, malignancy, syncopal episodes, transient systolic blood pressure greater than 100 mmHg, and arterial oxygen saturation lower than 90%.<sup>(1)</sup> Isolated RVT is extremely rare, and it is constantly associated with pulmonary embolism or deep vein thrombosis or RV infarction (1-2). We reported a case of isolated RV thrombus with severe chronic obstructive pulmonary disease.

**Case report:** An 80-year-old male patient presented to our emergency department with dyspnea with an oxygen saturation of 74%, tachypnoea, and tachycardia. Medical history was positive for chronic obstructive pulmonary disease, Alzheimer's, diabetes mellitus, and atherosclerotic cardiac disease. The patient did not use his medication and oxygen treatment regularly. An examination of his lungs revealed wheezing or prolonged expiratory sound. The beat was regular, and the S1 and S2 were normal. There were no S3, S4, or murmurs. The electrocardiogram (ECG) showed T wave inversion in the anterior (V1-V5) and inferior leads (D2-D3-AVF), the previous ECG was similar. Thoracic computed tomography (CT) was negative for pulmonary embolism and abnormal masses. We applied routine TTE for assessment of cardiac function and we saw a 1.5x2.8 cm mass between right ventricular trabeculae. There was also right ventricular dilatation 2+ tricuspid regurgitation (TR) and tricuspid annular plane systolic excursion (TAPSE) measured 8 mm. We performed cardiac MRI to clarify the diagnosis. A nodular lesion in the right ventricle with a hypointense presentation and no enhancement on late gadolinium enhancement imaging was discovered using cardiac MRI. Apixaban medication was initiated and the patient was invited for a control examination.

### **Discussion**

Isolated RVT is extremely rare, even though the incidence of right ventricular thrombus is unknown, it has been associated with nephrotic syndrome, RV infarction, and particularly PE in the literature.<sup>(1-2-5-6)</sup> To the best of our knowledge, this is the first reported case isolated RV thrombus within severe chronic obstructive pulmonary disease.

Cor pulmonale is a clinical condition in which a pressure overload affects the right side of the heart, particularly the right ventricle (RV), causing variations in RV function and structure. PH, RV dilatation and RV longitudinal strain reduction associated with severe COPD in our case may have brought about thrombus formation.<sup>(7)</sup>

RV thrombus would be identified by transthoracic echocardiography, transeosophagal echocardiography, and cardiac magnetic resonance imaging. Despite the fact that TTE is the preferred method in clinical practice, diagnosing right ventricular thrombus is not always as easy as diagnosing LV thrombus. Newer studies suggest that CMR is the most specific technique for cardiac thrombi.<sup>(4-5)</sup> Although CMR is more expensive than TTE, it may be employed in the differential diagnosis of cardiac mass or when high-mortality diseases such as RVT are suspected.<sup>(3)</sup>

### **References:**

1-Deisy Barrios et al; Right heart thrombi in pulmonary embolism European Respiratory Journal Nov 2016, 48 (5) 1377-1385; doi:10.1183/13993003.01044-2016

2-Nkoke C, Faucher O, Camus L, Flork L. Free Floating Right Heart Thrombus Associated with Acute Pulmonary Embolism: An Unsettled Therapeutic Difficulty. Case Rep Cardiol. 2015;2015:364780. doi:10.1155/2015/364780

3-Massimo Barbagallo, Daryl Naef, Pascal Köpfli, Urs Hufschmid, Tilo Niemann, Rolf Gebker, Jürg Hans Beer, Hanane Hireche-Chiakoui, Right ventricular thrombus, a challenge in imaging diagnostics: a case series, *European Heart Journal - Case Reports*, Volume 5, Issue 9, September 2021 doi:10.1093/ehjcr/ytac340

4-Barkhausen J, Hunold P, Eggebrecht H, Schüler WO, Sabin GV, Erbel R, Debatin JF. Detection and characterization of intracardiac thrombi on MR imaging. *AJR Am J Roentgenol*. 2002 Dec;179(6):1539-44. doi: 10.2214/ajr.179.6.1791539.

5- Srichai MB, Junor C, Rodriguez LL, Stillman AE, Grimm RA, Lieber ML, et al. Clinical, imaging, and pathological characteristics of left ventricular thrombus: a comparison of contrast-enhanced magnetic resonance imaging, transthoracic echocardiography, and transesophageal echocardiography with surgical or pathological validation. *Am Heart J* 2006;152(July (1)): 75–84.

5-Tsang BK, Platts DG, Javorsky G, Brown MR. Right ventricular thrombus detection and multimodality imaging using contrast echocardiography and cardiac magnetic resonance imaging. *Heart Lung Circ*. 2012 Mar;21(3):185-8. doi: 10.1016/j.hlc.2011.08.012. Epub 2011 Sep 15.

6-Lempp, S., Schwenger, V. Isolated right ventricular thrombus in an adult patient with nephrotic syndrome: a case report. *J Med Case Reports* 11, 311 (2017).doi: 10.1186/s13256-017-1491-0

7-Mandoli GE, Sciacaluga C, Bandera F, et al. Cor pulmonale: the role of traditional and advanced echocardiography in the acute and chronic settings. *Heart Fail Rev*. 2021;26(2):263-275. doi:10.1007/s10741-020-10014-4