

A patient with dyspnea and tricuspid valve mobile structure: a case report

Chora z dusznością i tworem związanym z zastawką trójdzielną – opis przypadku



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Abstract

Dyspnea, defined as a feeling of breathlessness is one of the most often encountered complaints reported by patients. It is usually associated with many illnesses. Undiagnosed pulmonary embolism is a frequent cause of dyspnea. This report depicts a 59-year-old patient with a 12-year history of dyspnea with concurrent periodic undefined calf edema, which was undiagnosed progressing over a few months prior to presentation with stage III/IV NYHA congestive heart failure. Echocardiography revealed the right ventricle tumor in subvalvular apparatus of the tricuspid valve. The patient was qualified for right ventricle tumor excision. After the surgery her symptoms decreased, which was confirmed by the results of figurative tests performed. Diagnosis of dyspnea is a difficult and multi-directional task. It is worth realizing that the patient's recovery and avoidance of complications potentially leading to death depend on quick and accurate diagnosis and optimal treatment.

Key words: dyspnea, right ventricular tumor.

Streszczenie

Duszność definiowana jako uczucie braku tchu jest jednym z częściej zgłaszanych przez chorych objawów. Towarzyszy wielu stanom chorobowym. Częstą, choć rzadko rozpoznawaną przyczyną nasilających się duszności jest zatorowość płucna. W niniejszej publikacji opisano 59-letnią pacjentkę z nasilającą się od kilku miesięcy dusznością bez wyraźnej przyczyny, w czynnościowej klasie NYHA III/IV i z okresowo występującymi obrzękami podudzi. W badaniu echokardiograficznym w obrębie aparatu podzastawkowego zastawki trójdzielnej uwidoczniono guza komory prawej. Pacjentkę zakwalifikowano do operacyjnego usunięcia guza. W obserwacji odległej stwierdzono ustępowanie objawów, potwierdzone obiektywnymi wynikami badań obrazowych. Diagnostyka duszności jest zadaniem trudnym i wielokierunkowym. Należy pamiętać, że tylko od szybkości i trafności rozpoznania oraz optymalnego leczenia zależy poprawa stanu zdrowia chorego i niedopuszczenie do powikłań, w tym również do nagłego zgonu.

Słowa kluczowe: duszność, guz komory prawej

Introduction

Dyspnea, defined as a feeling of breathlessness is one of the most often encountered complaints reported by patients. It is usually associated with many illnesses and for this reason its diagnosis is complex and multidirectional.

As regards dyspnea duration, one could divide it into acute, chronic or paroxysmal nocturnal dyspnea. Chronic dyspnea can be associated with chronic obstructive pulmonary disease, interstitial pulmonary diseases, neoplasms, circulatory insufficiency, anemia, neuro-muscular system diseases and chronic pulmonary insufficiency.

Pulmonary embolism is a frequent cause of dyspnea but it is difficult to diagnose. Diagnosis of acute large pul-

monary embolus may be less demanding since the pulmonary system is often a target of the initial evaluation period. On the other hand, gradually increasing dyspnea with coexisting lung disease focuses on chronic intrinsic lung problems. This may lead to missed diagnosis of chronic pulmonary embolism. Factors predisposing to pulmonary embolism are: venous thromboembolism, neoplasms, coagulopathies, advanced age, hormone replacement therapy including hormonal contraceptives.

Patient's description

A 59-year-old woman was admitted to the Department of Cardiology due to dyspnea which lasted for 12 years,

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aggravated by exertion-rated as the III/IV degree of NYHA scale and periodically accompanied by lower limb edema. During anamnesis, the patient reported episodes of laryngitis and tonsillitis in the past and pneumonia complicated by septicemia about 18 years ago. About 25 years ago, the patient quit smoking.

During the physical examination, a slight excess of body weight was found (BMI-26). On chest examination, alveolar sounds without any adventitious sounds were found. The heart rate was regular, about 80 beats per minute. Heart sounds of average loudness, properly accentuated. Abdo-



Fig. 1. Transthoracic echocardiography, four-chamber view – the arrow is indicating the right ventricle tumor localized near the tricuspid valve

menal examination was negative. Lower extremities revealed slight edema, no asymmetry and no calf tenderness.

Laboratory tests revealed no changes in blood count, glucose, creatinine, sodium, potassium, and triglyceride serum levels, but total cholesterol and low density cholesterol levels were increased. D-dimer determination showed its normal range (231 ng/ml – appropriate level lower than 500 ng/ml). On the chest X-ray, no pathologic changes were found. Echocardiographic examination revealed right atrial and right ventricular enlargement with slight tricuspid valve insufficiency and left ventricular hyperkinesis. Pulmonary artery blood pressure was increased to 37 mm Hg. In the right ventricle, echocardiography revealed 16 mm × 11.5 mm mobile structure, periodically migrating through tricuspid valve (Fig. 1 and 2).

Transesophageal echocardiography confirmed presence of the right ventricle dense tumor. Due to a suspicion of pulmonary embolism, 64-slice CT angiography scan of pulmonary arteries was performed, which showed normal diameters of the pulmonary artery (29.8 mm) and its branches. Furthermore, it revealed small adhesions between diaphragm and pleura. Standard 12-lead ECG was normal. Coronary angiogram showed no changes in coronary arteries. Due to the presence of mobile structure, likely connected to subvalvular apparatus of tricuspid valve, the patient was qualified for surgery.

Surgery was performed in June 2009. During the operation, a grey-yellow calcified, 18-mm diameter mass connected to the anterior leaflet of the tricuspid valve was excised. There were no postoperative complications. The pathologic examination showed the tumor to be a calcified thrombus.

Lung perfusion scintigraphy performed during the postoperative period revealed loss of blood flow in segment 5, and its decreased flow in segments 4, 9 and 10 of the right lung and irregular blood flow in the left lung with decre-



Fig. 2. Mobile tumor noticeable near the tricuspid valve – chest X-ray fluoroscopy during coronary angiography

ased perfusion in segments 1 and 10. 5 months after the first scintigraphy, a control examination was performed, showing a decrease of blood flow abnormality in segment 10 of the right lung (Fig. 3).

During 12 months of observation, the patient reported significant improvement in well-being. At present the patient has no dyspnea and her exertion capacity is rated as the first degree NYHA scale. There is no lower limb edema.

Discussion

The above case study exemplifies diagnostic problems of dyspnea in patient without comorbidities. Patient’s dyspnea symptoms, especially during exertion, had a 12 years’ history. We can only suppose that there was no earlier diagnosis because of small symptom intensity. Further history showed that the tumor’s removal was followed by symptom abatement. Additionally due to the fact that the tumor was calcified we can conclude that it was present in the right ventricle for many years.

Tumors localized on the right side of the heart most often are myxomas or thrombi. Much more rarely you can find there other types of primary or metastatic neoplastic tumors, infective endocarditis abscesses and vegetations and foreign bodies e.g. electrodes, fragments of intravenous or diagnostic catheters and even such strange items like a bullet. Moreover, the echocardiographic examination is capable of diagnosing in the right atrium such structures like Eustachian valve, Chiari’s net and lipomatous hypertrophy of interatrial septum, massive valvular annulus calcifications and presence of parasites. Additionally, extra-cardiac masses (e.g. pulmonary and mediastinal tumors, hiatal hernia, big hematoma, aneurysm or coronary fistula)

which compress heart structures can imitate tumor presence in some examinations [1].

In the opinion of the authors and consulting cardiac surgeon, due to prominent tumor mobility, there was a big possibility of tumor separation from the valve and as a consequence, pulmonary embolism occurrence. Due to possibility of this complication, the surgery was performed immediately.

According to published statistic data, thrombi in the “right heart” are found in 7-18% of cases of pulmonary embolism. In some cases, right atrial/ventricular thrombi accompany thromboangiitis, abdominal neoplasms, ulcerative colitis, and coagulopathy e.g. antiphospholipid syndrome or occur during hormonal contraceptive use [2, 3]. Augmented coagulability can be associated with intrinsic coagulation system activation, and as a consequence, with increase in thromboembolic complications in women [3]. Among many etiologies of heart thrombi, in our patient, a history of pneumonia complicated by septicemia was most probable. Thrombus formation mechanism in the patient with grave pulmonary infections depends on the increase in C-reactive protein, fibrinogen and inflammatory cytokine levels [4]. Intravascular coagulation process and thrombus formation during septicemia are related to cytokine-depending external coagulation system stimulation with abnormal anticoagulation system function (antithrombin III, thrombomodulin).

Another substantial factor of thrombus formation is slowing of blood flow coexisting with heart failure. Thrombus formation is very rare in a properly functioning heart [4]. You can find two types of thrombi in the heart: those connected with a wall of the heart, mostly flat and immobile, and mo-

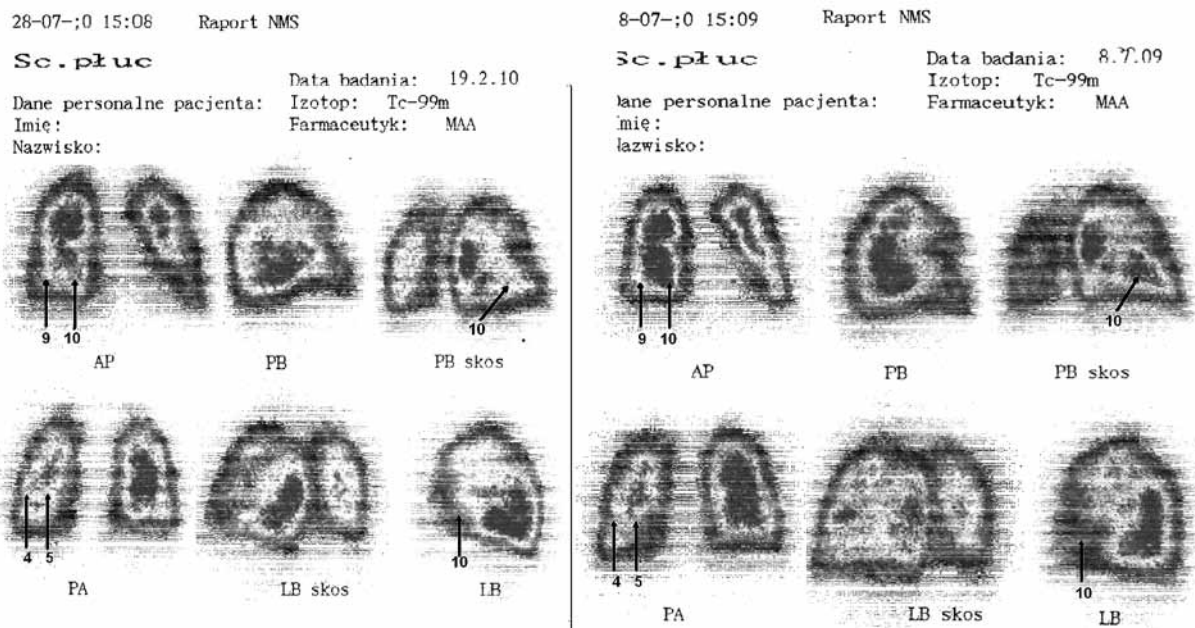


Fig. 3A-B. A – Primary lung perfusion scintigraphy showed a decrease of radioisotope concentration in segments 5 and partially 4, 9 and 10 of the right lung and irregular radioisotope concentration in the left lung with decreased perfusion in segments 1 and 10. B – Control perfusion scintigraphy (after 5 months) – improvement of perfusion in lung segment 10

bile thrombi, not connected to any part of the heart, which usually migrate through the “right heart” to the pulmonary artery. Immobile thrombi occurrence is linked to heart failure, heart inflammations in congenital defects and often accompany foreign bodies inside the heart. This type of thrombus is rare because of pulmonary embolism. On the other hand, mobile thrombi originate in peripheral veins. Their oblong, often fingered shape, good mobility and co-existing inflammation, increase the risk of propagation [5]. The tumor found in our patient, despite strong attachment to heart structures, was very mobile, because it was fixed to the tricuspid valve leaflet. Pulmonary embolism is one of the most serious complications of “right heart” thrombi. It accompanies nearly 98% of “right heart” thrombi [6]. The most frequent symptom is dyspnea on exertion, or when many pulmonary arteries are closed, dyspnea at rest [2]. It is worth noticing that presence of viable thrombus in the right atrium or ventricle can be a cause of sudden death in 20% of patients [7]. In our patient, echocardiographic examination revealed augmented pulmonary artery pressure. Because of this, CT angiography was performed to visualize pulmonary arteries. In meta-analysis performed by Mos et al. [8], in order to determine the safety of CT angiography in diagnosing pulmonary embolism, researchers reaffirmed this method to be safe to exclude pulmonary embolism in all patients in whom computed tomography pulmonary angiography was required. This method failed in our patient. Small dimensions of occluded arteries and small dimensions of thrombi which did not occlude arteries but were responsible for their stenosis were probably the reason for the negative result of performed CT angiography. Despite negative results of CT angiography, it was decided to start low molecular weight heparin treatment and the patient was qualified for the right ventricular tumor excision followed by symptom disappearance. Similar symptoms decrease after anticoagulation treatment in a patient with right ventricle thrombus and negative CT angiography result was reported by Wożakowska-Kapton et al. [9]. In their evaluation, microthrombosis, invisible in CT angiography, was also responsible for the patient’s symptoms.

There are different opinions how to treat “right heart” thrombi. Sontineni et al. [5] showed 100% mortality in a non-treated group and did not find any differences between patients treated with thrombolytic agents and non-treated group. Surgery was less frequently associated with complications. Results reported by Sökmen et al. [10] suggest an increased risk of thrombus fragmentation during thrombolysis, and possibility of its migration to the pulmo-

nary arteries. All of the above-cited authors suggest surgical treatment as the first mode of therapy. A similar opinion was expressed by Yamanichi et al., who recognized presence of mobile thrombus in the right ventricle as a life-threatening state. Surgery performed in our patient resulted in subjective symptom decrease. Control perfusion scintigraphy performed 5 months after initial examination showed partial resolution of pulmonary perfusion abnormalities.

Summary

The case of a patient with a progressing dyspnea presented in this paper required a thorough extensive diagnosis and prompt treatment. This can improve the patient’s quality of life and minimize probability of life-threatening complications.

All the figures placed in this paper belong to archives of the Department of Cardiology, Medical University of Silesia in Katowice.

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