International Journal of Research in Medical Sciences
Ludhmila K et al. Int J Res Med Sci. 2024 Dec;12(12):4711-4715
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20243728

Case Report

A clinical case of a patient with left atrial myxoma and obstructive coronary atherosclerosis

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Received: 23 September 2024
Accepted: 14 November 2024

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ABSTRACT

A 74-year-old patient, who was under examination, presented several symptoms, including weakness, cough, rapid heartbeat, tenderness and pain behind the sternum. With the help of transthoracic and transoesophageal echocardiography the patient was diagnosed with left atrial myxoma. When coronary angiography was performed, the patient was diagnosed with obstructive coronary atherosclerosis, including occlusion of left anterior descending artery and 75% stenosis of right coronary artery. After confirmation of the diagnosis patient underwent surgery, which included CABG and excision of myxoma in left atrium. Although the patient experienced some postoperative complications such as post cardiotomy syndrome, bilateral hydrothorax, mild anaemia and left lung pneumonia, she was discharged from the hospital with a stable condition. The patient was also given several recommendations to help overcome her complications, including dietary changes, wearing a chest compressor brace, and taking several medications, including antiplatelet agents, diuretics, beta-blockers and ARBs.

Keywords: Left atrial myxoma, coronary angiography, atherosclerosis, Coronary Artery Bypass Graft surgery, Post cardiotomy, Bilateral hydrothorax, Mild anemia, Left lung pneumonia

INTRODUCTION

Cardiac myxoma is one of a commonly occurring benign tumor that frequently develops in the hearts left atrium.[1] Despite its potential to mimic cardiac failure symptoms, a direct correlation between left atrium myxoma and left ventricular dysfunction is yet to be established. However, recent cases of left atrium myxoma accompanied by severe left ventricular dysfunction suggest the need for further investigation.

Atrial myxomas are mostly presented with constitutional, embolic, and obstruction symptoms, with over 70% of all cases occurring in the left atrium.[2] Left atrial myxomas may give rise to embolisms, heart obstructions, and systemic symptoms. The tumor can cause cardiac obstruction, emboli, and distal or coronary emboli, leading to acute coronary syndromes in patients.[3] Among the primary cardiac tumors, the most common type is Myxoma, typically seen in women during their third to fifth decade of life.[4] Therefore, it is vital for healthcare professionals to be well-informed about these findings to provide the best possible care to cardiac myxoma patients.

The common causes of new masses in the heart include blood clots, heart tumors, and vegetation.[5] Additionally, the cardiac myxomas, a rare multi-tumor syndrome caused by inactivating mutations or massive deletions in the PRKAR24A gene.[5] e4-related degeneration of cholinergic neurons and its possible contribution to memory deficits in e4-positive individuals.[4] It also suggests caution in attributing adverse effects of diverse medications, including benzodiazepines, to specific adverse effects of this allele on central cholinergic function. It advises caution in attributing adverse effects of diverse medications, including benzodiazepines, to specific adverse effects of this allele on central cholinergic function.[6] Lifestyle changes and early detection of heart disease are crucial in reducing the risk of heart attack or early death. The prevalence of risk factors is lower in

young adults, but lifestyle-related risk factors are more common.[7] Other risk factors like hypertension and diabetes can increase the likelihood of coronary atherosclerosis, even with controlled LDL-C levels.[8] It is essential to manage all relevant risk factors. Acute limb ischemia, atrial fibrillation (AF), or in situ arterial thrombosis can provoke atrial myxoma.[4,5]

Atrial myxoma is one of the rare types of neoplasms that affects the heart, and its pathogenesis is not yet fully understood. However, recently followed studies suggest that familial cardiac myxoma might be associated with Carney Syndrome, while disseminated cases could be linked to changes in endothelial cells, endocardial metabolism, and an increase in acid mucopolysaccharides. Although the direct link between atrial septal occlusion and myxomas in the left atria is yet to be established, some cases suggest the potential role of occludes in tumor formation. Chronic irritation from foreign objects and local inflammation can cause changes in endothelial cells and stromal components, eventually leading to tumor formation. Recurrence of the disease is most frequent in Carney complex and familial cardiac mucinous tumors, while recurrence of disseminated cardiac myxomas is uncommon. Ectopic recurrence often involves distinct embolic sites, thereby necessitating an individualized treatment approach that is tailored to the patient's specific needs. Long-term follow-up is crucial to ensuring the best possible outcomes for patients.

Clinical features of various medical conditions, including obstructive atherosclerotic narrowing of a major epicardial coronary artery, atrial myxoma, cardiac myxoma, and multiple systemic emboli, which present with diverse symptoms such as chest pain, syncope, exertional dyspnea, fatigue, palpitations, dizziness, unsteadiness, myalgia, arthralgia, malaise, weight loss, fever, breathlessness, pyrexia, cachexia, hemoptysis, and sudden cardiac arrest. A comprehensive physical examination is crucial to detect these conditions, and further research is warranted to explore the relationship between coronary artery disease and the mentioned symptoms.[4,9,11] Variations could be shown in the presentation of cardiac myxoma and atrial myxoma, with symptoms typically divided into three categories: constitutional and non-specific manifestations, embolization of the tumor, and obstructive symptoms.[12] Multiple systemic emboli often occur dramatically and require prompt medical attention.

Furthermore, the physical examination findings for these conditions vary, depending according to the size and location of the tumor, as well as any systemic or embolic features. Overall, the paper emphasizes the importance of recognizing the diverse clinical presentations of these medical conditions and highlights the need for early detection and management. The procedures for diagnosis include electrocardiography, transthoracic echocardiography, transoesophageal echocardiography, CT aortogram, cardiac angiography, and histology report. The diagnoses include ST elevation myocardial infarction, atrial myxoma, mild concentric left ventricular hypertrophy with a mass located in the left atrium, also a semi-mobile oval mass that is in the left atria with multiple interna.[8] Surgical intervention for their removal is highly successful, with a relatively low risk of tumor recurrence and recurrent embolism. Urgent surgery is typically recommended for symptomatic patients to prevent embolism.

The use of thrombolytic therapy has been effective in treating acute ischemic stroke corresponding with cardiac myxoma. The administration of anticoagulation therapy to patients with myxoma who are awaiting cardiac surgery or are deemed inoperable is a matter of debate within the medical community.[13] Symptomatic treatment may include the administration of intravenous diuretics and digoxin, and anticoagulation therapy using warfarin may also be initiated. Urgent surgical intervention is necessary for myxoma, as these intracardiac tumors must be excised with wide clearance to diminish the risk of recurrence.

The prognosis of atrial myxoma is generally favourable if the tumor is detected and treated early. Complete removal of the tumor surgically is the primary treatment, and the recurrence rate after surgery is low. However, in some cases, the tumor may recur after surgery, especially in patients with familial myxomas or Carney complex. If the tumor is untreated promptly, it can lead to systemic embolization, heart failure, and even sudden cardiac death. Therefore, early diagnosis and treatment are crucial for better outcomes. Long-term follow-up is also recommended to monitor for potential recurrence and to manage any associated complications.

CASE REPORT

Upon admission, the 74-year-old patient presented to Grodno State Clinical Cardiology Centre with complaints for shortness of breath in moderate exertion, lability of blood pressure (increase to 200/100 mmHg), general weakness, sleep disturbance, periodic discomfort in the heart area without a clear connection with physical exertion.

She had a long history of hypertension, and she was not taking drugs regularly. Also, she had more than 20 years history of insulin-dependent diabetes type 2. About 3 years ago, at the end of 2021, she suffered from Covid-19-associated pneumonia. During hospitalization in the therapeutic department an echocardiogram was performed and the formation of the left atrium was revealed. It was not clear if it was a myxoma or a thrombus in the left atrium. She was taking rivaroxaban 20 mg once a day for a period of 6 months, but there was no change in the size of the left atrial mass. In November 2023, she was consulted by a cardiologist at the Grodno State Clinical Cardiology Center outpatient department. An echocardiogram was performed, and a 25×17 mm oval-shaped movable formation was found in the left atrial cavity, which was attached to the middle third of the

interatrial septum without signs of wedging into the mitral valve. The diagnosis of left atrial myxoma was confirmed. After that she was consulted by a cardiac surgeon. Taking into account the examination data, surgical treatment was proposed. Informed consent was obtained, and later the patient was consulted by the selection commission for coronary angiography (protocol No. 20392 dated 12.12.2023). It was recommended to perform a diagnostic coronary angiography to determine the tactics of further management.

In February 2024 patient was admitted to interventional cardiology department of Grodno State Clinical Cardiology Center, where coronary angiography was performed. Under local anesthesia, an introducer was inserted into the right femoral artery and through it into the aorta, then selectively into the left coronary artery and right coronary artery, catheters were inserted. 150 ml of "omnipak-350" was introduced. Left coronary artery: trunk–without stenosis. Left anterior descending artery (LAD)–occlusion in the 1st segment. Circumflex artery–occlusion in the 1st segment. Right coronary artery: retrograde filling of the distal parts of the LAD (diameter of the native channel is less than 2 mm). Atherosclerotic erosion of the contours throughout, stenosis 75% in the proximal third, extended stenosis 75% in the middle-distal third of RCA was also revealed (Figure 1).

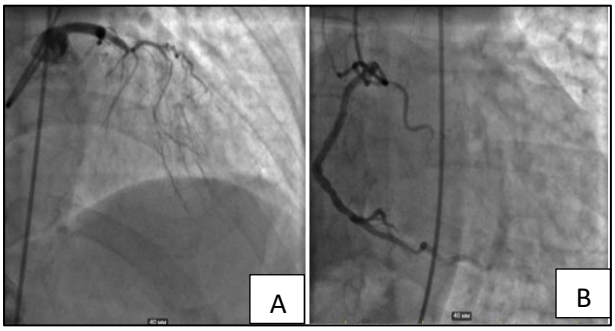

Figure 1 (A and B): Patient's coronary angiography.

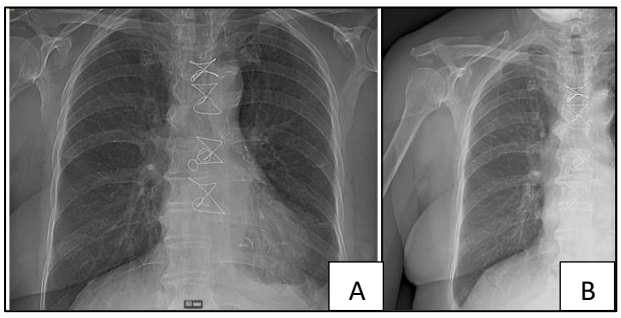

Figure 2 (A and B): Patient's X-Ray showing signs of left lobar pneumonia in basal segments and small bilateral effusion.

Transthoracic echocardiography revealed 36×17 mm movable formation in the left atrial cavity, which was attached to the middle third of the interatrial septum partially prolapsing into the cavity of the left ventricle. Signs of atherosclerotic lesions of the aorta and aortic valve and diastolic myocardial dysfunction of the left ventricle were also noted.

The next day patient was again consulted by a cardiac surgeon. Taking into account the examination data, the patient was indicated for surgical treatment–myocardial revascularization (CABG) and excision of left atrial myxoma. Hospitalization in the department of cardiac surgery was planned for March 2024. 12.03.2024 the patient was admitted for surgical treatment, and 15.03.2024 operation was performed. During intraoperational transesophageal echocardiography LA myxoma without a clear capsule was revealed. After longitudinal sternotomy pericardium was opened. The aorta was clamped, cardioplegia was applied to its root.

The vena cava were pressed out, the right atrium and interatrial septum were opened - a glandular myxoma on a narrow pedicle in the interatrial septum area was determined (35×55 mm), the myxoma and pedicle were excised, coagulation applied. After that LA and LV cavities were controlled for myxoma fragments-none found, followed by interatrial septum closure with a two-row suture. After that CABG was performed. Distal anastomoses of a. radialis in the ascending aorta (artery 1.8 mm, wall in satisfactory condition), autovein in the posterior interventricular artery (artery 2 mm, wall affected by atherosclerosis) were performed. Distal anastomosis of LIMA in the LAD in the 2nd segment was performed (lumen 2 mm, wall is thickened along its length). Aortic declampage was made. Cardiac activity was restored on its own. Proximal anastomoses of the autovein and a. radialis with the ascending aorta were performed. Control of transesophageal echocardiography showed no fragments of myxoma in the left atrium.

After the operation patient was transferred to the ICU department. The patient's general condition was severe but stable, with positive dynamics. She complained of general weakness, soreness in the area of the wound, drainage sites. The skin was dry and warm to the touch. Auscultation: vesicular respiration is heard in the lungs, weakened in the lower parts, RR–16-min. SPO2-97%. Heart sounds are rhythmic, muted, heart rate-92 beats/min, blood pressure-139/87 mmHg. CVD-5 mmHg. The abdomen participates in the act of breathing, with superficial palpation it is soft and painless. Urination by urethral catheter, diuresis is sufficient. There is a moderate amount of haemorrhagic discharge along the drains, there is a discharge of air through drainage from the pleural cavity. Body temperature is 36.6 C.

Her treatment included correction of the water-electrolyte balance, glycaemic level. For antiplatelet purposes, aspirin 75 mg orally at 14:00. For anticoagulant purposes, enoxaparin 0.4 ml 2 times a day. For antisecretory purposes, ulcer prevention-lansazole 30 mg orally at 20:00. In order to reduce heart rate, bisoprolol 2.5 mg once

a day. For lipid-lowering purposes, enterally rosuvastatin 10 mg once a day.

On the 2nd day she was transferred to cardio surgery department Patient's general condition is stable. She complained of pain in the area of the postoperative wound and general weakness. In the lungs, respiration was vesicular, weakened in the lower parts, RR 17 per minute. The pulse was rhythmic, 72 beats per minute. Blood pressure was 120/80 mmHg. The diuresis was sufficient.

Ultrasound of pleural cavities and pericardium showed that pericardium was not changed and there was no fluid in the pericardial cavity. However, in the left pleural cavity, a layer of liquid was determined above the dome of the diaphragm with a volume of ~350 ml. In the right pleural cavity, a layer of liquid was determined above the dome of the diaphragm with a volume of ~250 ml. Fibrinous overlays were not detected. On the 4th day the patient started complaining on the increase in body temperature to 38.6 C last night, accompanied by chills, rare dry cough. RR was 17 in min. SPO2 in atmospheric air was 95%. In the lungs, breathing was vesicular, weakened in the lower sections of both lungs, there were no wheezes. X-Ray which was performed that day showed that in the supradiaphragmatic basal sections on the left lung, decreases in pneumatization were determined, without clear contours, against which the dome of the diaphragm on the left was indistinct. The roots were structural and not expanded. The sinuses were not clearly traced, on the right the sine is darkened to the edge of the 9th edge, on the left to the edge of the 8th edge. Heart was expanded in diameter. The aorta was elongated and sclerosed. Signs of left lobar pneumonia in basal segments and small bilateral effusion were confirmed (Figure 2).

Clinical blood count showed elevation of WBCs up to 11.44 10^9/l (normal range 3.89-9.23 10^9/l) and ESR up to 20 mm/hour. However, procalcitonin level was not increased (0.05 ng/ml). Given the presence of pneumonia, postcardiotomy syndrome, and the need for further follow-up by a surgeon, she was transferred to the cardiological department to continue treatment. Antibacterial therapy for pneumonia was started including meropenem 1.0 g. intravenously b.i.d.

During the recovery period, the patient's condition was closely monitored, and additional tests were conducted to ensure that the patient was recovering well. The ECG showed a regular heartbeat, and the ST segment had returned to normal. The echocardiography revealed no signs of the mass in the left sided atrium, and the patient's CBC showed a significant decrease in the number of white blood cells (table 1).

The treatment in cardiology department included, spironolactone 25 mg 1 tablet at 12.00, furosemide 20 mg /day at 07.00 and 17.00, under control of blood pressure, potassium, creatinine, fluid levels in pleural cavities and pericardium, clopidogrel 75 mg 1 t at 17.00 constantly (according to the patient, she developed allergic rhinitis while taking aspirin) lercanidipine 5-10 mg at 17.00, bisoprolol 5 mg at 09.00, under blood pressure and heart rate control (at least 55 beats per minute) valsartan 160 mg 2 times a day, under blood pressure, potassium, creatinine control, atorvastatin 20 mg at 19.00, lipidogram control after 3 months (target TC level less than 4.5 mmol/l, LDL cholesterol less than 1.4 mmol/l, TG less than 1.7 mmol/l), if ineffective - correction of therapy, control of ALT,AST, CK after 3 months.

Further ultrasound of pleural cavities showed that in the pleural cavity on the right, free fluid was visualized: the thickness of the layer was 20 mm. In the pleural cavity on the left the layer thickness was 60 mm. After 3 days of treatment fluid was not visualized in the pleural cavity on the right. In the pleural cavity on the left, the layer thickness decreased to 40 mm.

After a few days of postoperative care and monitoring, the patient was discharged from the hospital with a stable condition. The patient was advised to follow up with the treating physicians periodically for further management and monitoring.

Table 1: Patients clinical blood counts and biochemical analysis.

Parameter	Value	Normal range
WBC	12.26 10v9/l	3.89-9.23 10v9/l
RBC (erythrocytes)	3.6 10 in12/l	(3.9-5.6) 10v12/l
HGB (hemoglobin)	110 g/l	(120-140) g/l
HCT (hematocrit)	32.40%	(36-50) %
Monocytes	0.96 10v9/l	(0.25-0.8) 10v9/l
Total protein	61 g/l	(65-85) g/l
Urea	10.35 mmol/l	2.2-8.3 mmol/l
Creatinine	121 µmol/l	53-97 µmol/l
Sodium	131 mmol/l	135-145 mmol/l
Eosinophils	2%	(0.5-5) %
C-reactive protein	137.9 mg/l	(0-6) mg/l

DISCUSSION

The case report illustrates a rare instance of reversible severe global left ventricular dysfunction attributed to the cardio depressant effect of myxoma, for which the precise mechanisms remain ambiguous, warranting further investigation. The report underscores the presence of coexisting coronary atherosclerosis as a recognized factor contributing to left ventricular dysfunction in myxoma, suggesting a multifaceted interplay of elements influencing the observed cardiac manifestations.

The discussion of this case report entails an interpretation of the results vis-à-vis previous studies. The authors

accentuate the significance of reversible severe global left ventricular dysfunction in left atrial myxoma, shedding light on potential underlying mechanisms and augmenting the extant corpus of knowledge pertaining to cardiac complications associated with myxoma.[14]

In comparing these findings with prior studies, the report concurs with the documented incidence of embolization in myxoma-afflicted patients, underscoring the frequent systemic embolism, particularly in left atrial myxomas. The discussion also probes into the disparities in embolic symptoms and the exceptional presentation of progressive symptoms observed in the cases under review, thereby underscore the complexity and variability of myxoma-related complications. Moreover, the discussion underscores the relevance of neovascularization and the chronic inflammatory status induced by myxoma, alongside the potential impact of growth factors and cytokines on the emergence and severity of symptoms. By drawing parallels with antecedent studies, the discussion furnishes valuable insights into the pathophysiological facets of myxoma-related left ventricular dysfunction and the interplay between myxoma, atherosclerosis, and inflammatory processes.

CONCLUSION

In conclusion, the co-occurrence of two components the left atrial myxoma and atherosclerosis can complicate the health management of patients with multiple comorbidities. Atherosclerosis is characterized by chronic inflammation that leads to arterial wall damage, increasing the risk of embolic events and adverse outcomes within the left atrial myxoma patients. As a rare primary cardiac tumor, left atrial myxoma could be manifested with several different symptoms, making early detection and prompt treatment essential to prevent potentially life-threatening complications. The development of individualized treatment plans under an interdisciplinary team approach is vital to achieve optimal outcomes in patients who are going through these conditions. The case report presented herein illuminates the significance of further research to study the connection between left atrial myxoma as well as atherosclerosis and their impact on treatment outcomes in patients with multiple comorbidities. Healthcare providers must remain vigilant and consider the coexistence of these conditions in the management plan of patients with complex comorbidities to ensure optimal outcomes.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Ludhmila K, Shafran M, Hafeel A, Silva PD. A clinical case of a patient with left atrial myxoma and obstructive coronary atherosclerosis. Int J Res Med Sci 2024;12:4711-5.