CASE REPORT

Incidental left atrial appendage aneurysm with suspected left ventricular fistulous communication in a patient with metastatic non-small cell lung cancer

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ABSTRACT

Left atrial appendage aneurysm (LAAA) is a rare cardiac abnormality, usually identified incidentally or after complications such as arrhythmia, thromboembolism, or hemodynamic compromise. We report the case of a 63-year-old woman in whom a markedly dilated left atrial appendage was discovered incidentally during staging investigations for suspected malignancy. Cross-sectional imaging and transthoracic echocardiography demonstrated a large aneurysmal structure adjacent to the left atrium, with bidirectional flow between the left ventricle and the aneurysm, raising suspicion of a fistulous communication. Further imaging also confirmed stage IV non-small cell lung carcinoma with metastatic disease, together with a complex enlarging ovarian mass. In view of the patient's advanced malignancy, absence of cardiac symptoms, and limited life expectancy, a conservative management strategy was adopted following multidisciplinary discussion. This case highlights the diagnostic complexity of incidental cardiac findings in patients with multimorbidity, the importance of multimodality imaging in defining rare structural abnormalities, and the value of multidisciplinary decision-making in aligning treatment with overall prognosis.

KEYWORDS: Left atrial appendage aneurysm; left ventricular fistula; incidental cardiac mass; multimodality imaging; conservative management.

INTRODUCTION

Cardiac aneurysms are uncommon, most frequently arising in the ventricles after myocardial infarction. In contrast, aneurysms of the left atrial appendage (LAA) are exceedingly rare, with a recent systematic review reporting approximately 216 cases worldwide [1-3]. They may present with arrhythmias, thromboembolic events, or hemodynamic compromise, but in a significant proportion of cases, they are asymptomatic and discovered incidentally [4]. Early recognition is important as these aneurysms can be misdiagnosed as other cardiac masses and may confer substantial risk if left untreated [2]. While surgical resection is often advocated in symptomatic or high-risk cases, conservative management has also been reported, particularly where comorbidity limits intervention [5].

We report the case of a 63-year-old female in whom an LAA aneurysm was discovered incidentally during investigations for suspected malignant transformation of an ovarian mass and a right hilar lung lesion with metastatic spread. Advanced imaging confirmed a markedly dilated LAA with a suspected bidirectional fistulous communication with the left ventricle. This appears to be an exceptionally rare finding; no cases of LAAA with left ventricular fistulous communication were identified in the largest recent systematic review of 216 reported cases [3]. Given the context of advanced malignancy and absence of cardiac symptoms, a conservative approach was adopted. This case highlights the diagnostic challenges of multimorbidity, the value of systematic imaging review, and the necessity of multidisciplinary team discussion in guiding management decisions.

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CASE PRESENTATION

A 63-year-old female presented initially to her general practitioner (GP) with non-specific complaints of leg swelling, fatigue, and post-menopausal bleeding, in association with a change in vaginal discharge. Her past medical history included fibromyalgia, arthritis, depression, hypothyroidism, and chronic kidney disease stage 3. Current medications were paroxetine, levothyroxine, hormone replacement therapy,

baclofen, pregabalin, furosemide, omeprazole, co-codamol, amitriptyline, and tramadol. She was an active smoker.

On examination at her GP surgery, pelvic assessment revealed a yellowish discharge and suprapubic tenderness. A subsequent review one month later identified a systolic murmur, with prior records noting an echocardiogram performed in 2005 for a murmur.

Initial blood investigations demonstrated elevated N-terminal pro-B-type natriuretic peptide (874 ng/L) (normal range: < 150ng/L), raised C-reactive protein (29 mg/L) (normal range: < 5 mg/L), and increased cancer antigen 125 (45 U/mL) (normal range: <35 U/mL). Paraproteinemia was later confirmed on serum electrophoresis. Other hematological and biochemical parameters, including thyroid function, liver function, and bone profile, were largely within normal limits.

Pelvic USG revealed a known ovarian mass, originally presumed to be a fibroma or fibrothecoma on MRI in 2021, which had significantly enlarged. By April 2025, ultrasound showed the lesion measuring $17.9 \times 11.5 \times 9.3$ cm with new cystic components. MRI pelvis in May 2025 demonstrated further enlargement ($16.7 \times 10.6 \times 15$ cm) with multiple new cystic foci, stromal enhancement, and diffusion restriction, raising suspicion of malignant transformation.

A subsequent CT chest, abdomen, and pelvis performed in June 2025 confirmed the complex ovarian lesion but also identified multiple additional pathologies, including several pancreatic masses, a left adrenal lesion, a right upper lobe pulmonary mass with mediastinal invasion, and, incidentally, a large aneurysmal dilation adjacent to the left atrium (Figure 1).

Electrocardiogram showed normal sinus rhythm, heart rate 79 bpm. Echocardiography revealed a 60×69 mm echo-free structure adjacent to the left atrium compressing the basal anterior and anterolateral left ventricular walls. Color Doppler demonstrated a bidirectional communication between the left ventricle and the structure, suspicious of a fistulous connection. Left ventricular systolic function was preserved (ejection fraction 56%). A small, loculated pericardial effusion was also present, without hemodynamic compromise (Figures 2 and 3), and no thrombus was identified within the heart chambers.

Whole-body PET-CT confirmed a hypermetabolic right hilar/paramediastinal mass with mediastinal lymphadenopathy and pancreatic and adrenal metastases, consistent with stage IV (T4N3M1c) non-small cell lung carcinoma. The pelvic mass demonstrated areas of FDG uptake, but of lower avidity than the pulmonary lesion.

The patient's case was reviewed at multiple multidisciplinary team (MDT) meetings. Given the advanced stage of lung malignancy, the ovarian lesion was considered secondary in importance and managed expectantly. Cardiology MDT discussion concluded that the aneurysmal left atrial appendage, with probable ventriculo-atrial fistula, represented an extremely rare incidental finding. In the absence of cardiac symptoms and in view of her limited oncological prognosis, a conservative approach was adopted.

Additionally, her case was reviewed in the gynecology, gastroenterology, and lung cancer MDT meetings. The gynecology and gastroenterology MDTs recommended no further intervention, whereas the lung cancer MDT advised endobronchial ultrasound-guided fine-needle aspiration

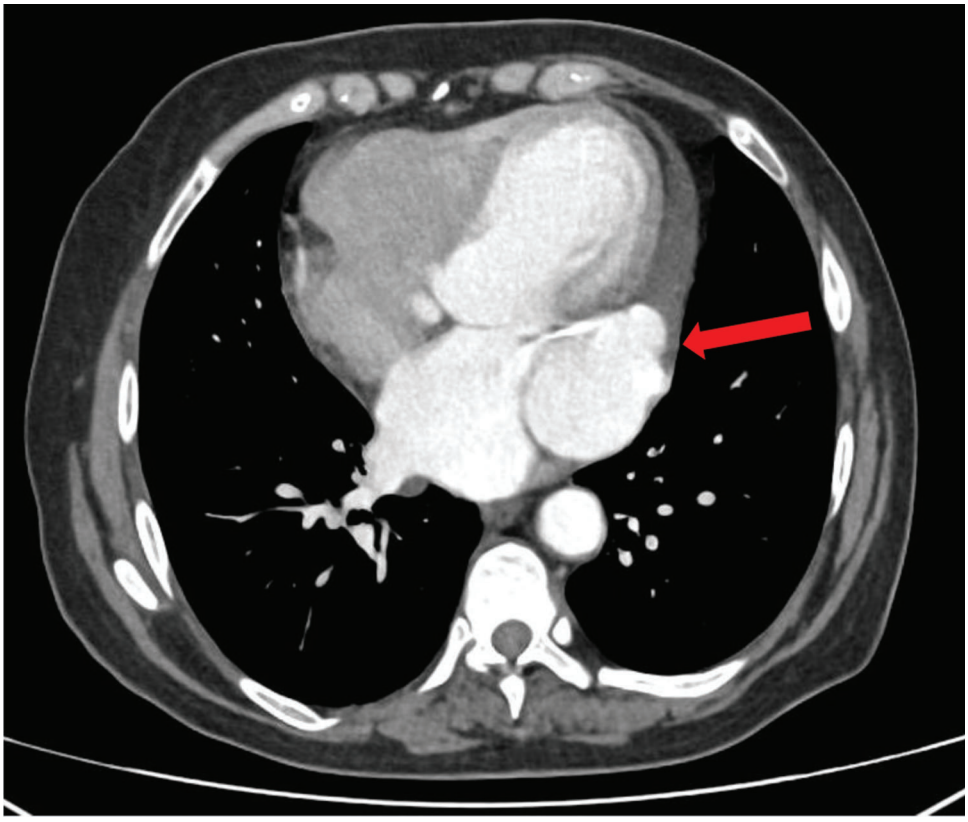

Fig. 1. CT-TAP showing large aneurysmal dilation adjacent to the left atrium (arrow).

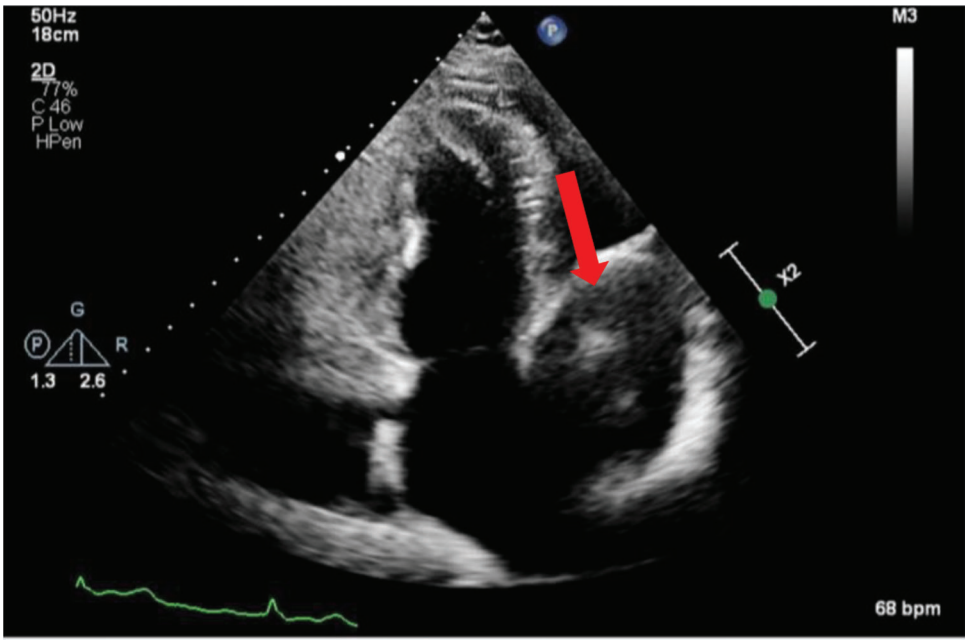

Fig. 2. TTE showing large aneurysmal dilation adjacent to the left atrium (arrow).

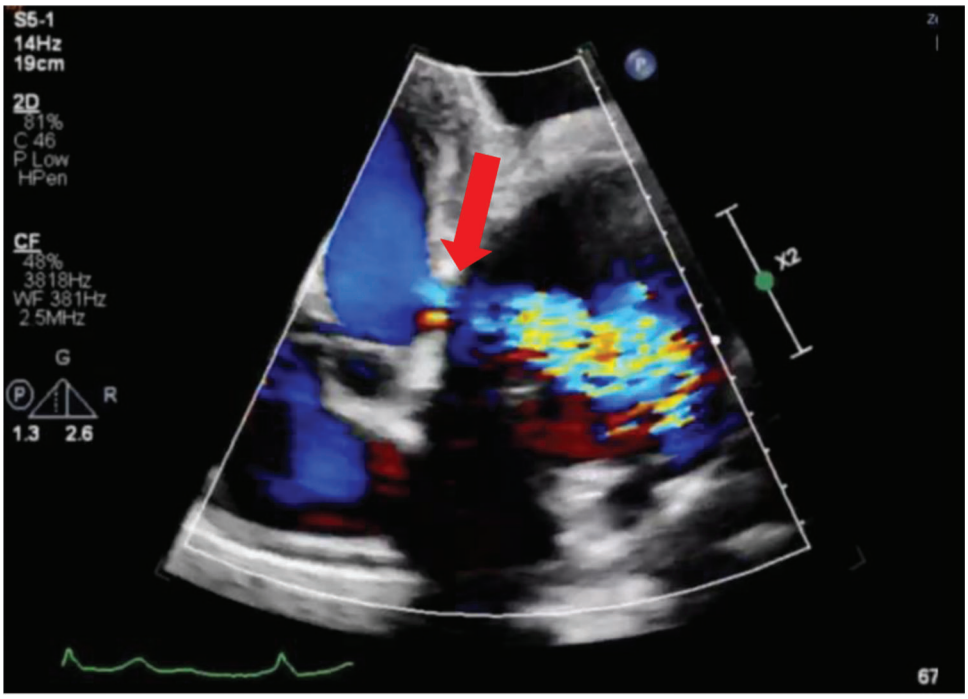

Fig. 3. TTE with color Doppler demonstrating bidirectional flow between the left ventricle and the left atrial appendage aneurysm (arrow), suggestive of a fistulous communication.

(EBUS FNA) and a vascular referral. Unfortunately, the patient passed away before any further investigations were done.

DISCUSSION

The present case adds to the limited body of literature on left atrial appendage aneurysms (LAAA), a condition that remains rare, although recent systematic reviews have substantially expanded the number of reported cases [1,6]. LAAA has been described across a wide age spectrum, though it most frequently presents in patients in their third decade of life [2]. In keeping with existing reports, many cases are identified incidentally, with approximately 40% of patients remaining asymptomatic at diagnosis, as in this case [3]. When symptoms do occur, they most commonly include palpitations and dyspnea, while chest pain is less frequently reported. Arrhythmias are a recognized complication,

particularly atrial fibrillation, followed by atrial flutter and supraventricular tachycardia [1]; no dysrhythmia was observed in our patient.

Beyond rhythm disturbances, LAAA carries a risk of structural and hemodynamic complications. Compression of adjacent cardiac and extracardiac structures has been documented, including effects on the left ventricle [7], coronary arteries [8], and pulmonary vasculature [4]. Thromboembolic events, particularly stroke, represent another significant clinical concern and are well described in the literature [9]. Anticoagulation may be considered in patients with demonstrable thrombus or high thromboembolic risk (for example those with proven arrhythmias) [12], although its role in the absence of thrombus, as in the present case, is less well defined and was not pursued.

The anatomical nature of the suspected communication in this case warrants careful consideration of the differential diagnosis. Possible alternative explanations for a bidirectional flow signal between the left ventricle and an aneurysmal structure adjacent to the left atrium include a congenital sub-mitral (subvalvular) aneurysm, a coronary artery aneurysm eroding into an adjacent chamber, a ventricular diverticulum, or a true or false (pseudo-)left ventricular aneurysm communicating with the left atrium or LAA. Distinguishing between these entities depends on detailed characterization of the neck, wall composition, and flow dynamics of the communicating channel, which is best achieved with cardiac CT angiography, cardiac MRI, or invasive angiography. In this patient, transthoracic echocardiography demonstrated bidirectional flow consistent with a fistulous connection, but dedicated cross-sectional angiographic confirmation was not obtained, owing to the patient's rapid clinical deterioration and limited prognosis. The diagnosis of a left ventricular–left atrial appendage fistula in this case should therefore be regarded as the most probable explanation on the available imaging, rather than a definitively confirmed anatomical diagnosis; this represents an important limitation of the present report.

Multimodality imaging plays a central role in the diagnosis and characterization of LAAA, particularly in complex cases. Echocardiography often serves as the initial modality, allowing identification of aneurysmal dilation and assessment of hemodynamic consequences [2]. Cross-sectional imaging with computed tomography and cardiac magnetic resonance provides superior anatomical delineation, enabling evaluation of size, morphology, and relationships with adjacent structures. In selected cases, positron emission tomography may assist in differentiating benign from malignant or inflammatory processes. The integration of multiple imaging modalities is particularly valuable in patients with coexisting pathologies, as it allows accurate diagnosis while avoiding misclassification of rare entities such as LAAA, especially when atypical features such as fistulous communication are present [1].

The left atrial appendage aneurysm in this case was managed conservatively for several reasons. One of these included the asymptomatic nature of the condition in this patient. Symptoms that patients might experience include palpitations, dyspnea, chest discomfort, and thromboembolic events; however, this patient did not present with any of these features, and asymptomatic presentation is well recognized in the literature [1]. Another determining factor was the patient's advanced oncological disease, which significantly limited life expectancy. This included ovarian malignancy and lung malignancy with pancreatic and adrenal metastases. Multidisciplinary team discussions involving gynecology and gastroenterology concluded that no further oncological treatment was appropriate. In this context, intervention for the LAAA would be unlikely to confer meaningful survival benefit and carried a risk of procedure-related complications. As a result, conservative management was considered the most appropriate approach.

If surgical management were to be pursued, this would typically involve median sternotomy with cardiopulmonary bypass, aneurysmectomy, and atrial reconstruction, particularly in cases of large aneurysms, associated cardiac defects, or thrombus formation. Less invasive approaches, such as left mini-thoracotomy, have also been described in selected patients without thrombus [2,11]. However, these interventions are not without risk, including bleeding, infection, and thromboembolic complications. While surgery may reduce long-term risks such as arrhythmia, thromboembolism, and cardiac dysfunction, in this patient the balance of risk versus benefit clearly favored conservative management given the overall prognosis [5].

If left untreated, LAAA may lead to several clinically significant complications. These include thrombus formation within the aneurysm with subsequent embolization, atrial arrhythmias, progressive cardiac dysfunction, and compression of surrounding cardiac or vascular structures. However, the likelihood of these complications must always be interpreted within the broader clinical context, particularly in patients with limited life expectancy due to non-cardiac disease.

This case also highlights important diagnostic challenges. The presence of significant multimorbidity, combined with multiple incidental findings, complicated both diagnostic evaluation and clinical prioritization. Initial investigations for suspected gynecological malignancy revealed additional pathologies, necessitating input from multiple specialties. Collaboration between respiratory, gynecology, gastroenterology, cardiology, and vascular surgery teams was required to determine the relative urgency of each finding. In the context of stage IV lung cancer, the LAAA and other incidental findings were deemed lower priority and therefore managed conservatively. This reflects the importance of distinguishing clinically urgent from non-urgent conditions, particularly in patients with advanced malignancy [12].

CONCLUSION

This case describes an exceptionally rare left atrial appendage aneurysm with suspected fistulous communication to the left ventricle. It highlights the variable and often asymptomatic nature of LAAA despite recognized risks such as arrhythmia, thromboembolism, and structural compression.

The case underscores the importance of multimodality imaging for accurate diagnosis and the need for multidisciplinary decision-making in patients with complex comorbidities. Conservative management was appropriate given the patient's lack of symptoms and advanced metastatic disease, reflecting the need to align intervention with overall prognosis.

Written informed consent

Written informed consent was obtained from the patient for publication of this case report.

Declarations

There are no conflicts of interest to declare. No funding was received to write this article.

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