Clinical Images and Case Reports Journal

Case Report | Vol 2 Iss 3

Radiotherapy Induced Left Atrial Myxoma in a Non-Small Cell Lung Cancer Patient

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Received: May 28, 2020; **Accepted:** June 10, 2020; **Published:** July 04, 2020

Abstract

In the present case study, we describe a 66 year old male with an atrial myxoma diagnosed eight years after treatment for non-small cell lung cancer. In 2012 he received chemo-radiotherapy (mediastinal area) for stage III-A adenocarcinoma of the lung. In 2020, a left atrial mass was seen on follow-up imaging, with characteristic findings of a cardiac myxoma. In addition, diffuse bilateral pulmonary nodules (up to 5 mm in diameter) and left mediastinal lymphadenopathy were noted. In retrospect, the cardiac mass could be seen on a follow-up Computed Tomographic (CT) scan in 2017 within the radiated mediastinal field. The cardiac mass was excised at surgery, and pathologic examination confirmed the diagnosis of myxoma. To the best of our knowledge, this is the first case to be reported of a left atrial myxoma in a patient treated for adenocarcinoma of the lung and the first atrial myxoma reported to occur in a previously irradiated site.

Keywords: Lung adenocarcinoma; Myxoma; Radiotherapy; Rare tumor; Malignant tumor

Introduction

Primary cardiac neoplasms of the heart are extremely rare with a life time incidence of less than 0.02 % [1]. Cardiac myxomas are the predominant type accounting for more than half of all primary cardiac tumors [2]. About 90 % of cardiac myxomas are located in the left atrium, mainly adherent to the atrial septum near the fossa ovalis [3]. These tumors arise from mesenchymal cell origin that produces mucopolysaccharide and immature collagen [4]. Echocardiography is the method of choice for the diagnosis of cardiac tumors with early surgical resection the only effective treatment to prevent life-threatening complications

caused by obstruction of intra-cardiac blood flow or embolization [5,6]. To the best of our knowledge there are no reports of the cases of cardiac myxoma after treatment for lung cancer. Lung cancer is the leading cause of cancer death worldwide [7].
It can metastasize to almost every region of the body, including the heart cavity. Lung cancer is the most common cause of cardiac metastases (17-26 %) however we were unable to find any reports of lung adenocarcinoma spreading to the endocardium [8]. A cardiac myxoma has certain characteristic features that when concomitant with a malignant neoplasm that may lead to misdiagnosis as metastasis due to its rare occurrence. We present, to the best of our knowledge, the first reported case of cardiac myxoma, mimicking metastases of a malignant tumor in a patient treated for adenocarcinoma of the lung. In addition, this is to our knowledge, the first report of an atrial myxoma occurring in a previously irradiated field.

Case Report

A 58-year old, male, was referred to the emergency room in January 2012 by a primary care physician with cough and shortness of breath. He was a smoker (35 pack-years in the previous 16 years), on treatment for type 2 diabetes mellitus with no history of cardiac or other disease. There was no family history of cancer. He complained of right sided chest pain that had persisted for three months and more recently, weight loss (4 kg in the last month).

Physical examination revealed decreased breath sounds over the right lung and cardiovascular examination including electrocardiogram and auscultation were normal. Routine laboratory investigations (complete blood count, and biochemical profile) showed no abnormalities. Chest radiograph showed-Right Upper Lung (RUL) ground-glass opacity. He was admitted to the hospital for further evaluation. Chest CT scan showed: A 3 cm mass in the RUL and right (RT) mediastinal lymphadenopathy with an enlarged node of 2 cm diameter. Positron Emission Tomography-Computed Tomography (PET-CT) showed hyper-metabolic uptake in the RUL (the 3 cm mass) and other areas of uptake in the RT mediastinal area and RT pulmonary hilum.

A biopsy was taken under CT guidance from the RUL mass, with histopathologic findings adenocarcinoma of lung origin.
Magnetic Resonance Imaging (MRI) of the head was done for further investigation which showed no evidence of metastatic disease. The presumptive clinical diagnosis was stage T1b N2 M0 (stage 3-A) non-small cell lung cancer.
The patient underwent tumor resection (right upper lobectomy), with free margins. Primary treatment with combined Chemo-Radiotherapy (CRT) was recommended.

The patient received sequential CRT consisting of vinorelbine 30 mg/m^2 on days 1 and 8 every 21 days plus cisplatin 75 mg/m^2 on day 1 every 21 days for 4 cycles followed by definitive radiotherapy, using 3-Dimensional CT guided treatment planning and photon treatment on a linear accelerator to the mediastinal area (Figure 1) with a total dose of 60 Gy that was given with daily fractions of 2 Gy. At one month follow-up, chest CT- showed no evidence of disease and after two months of follow-up, the major symptoms (coughing, dyspnea) were completely resolved. Follow-up through 2019 with imaging studies-MRI of head, CT of chest, and PET-CT showed no evidence of disease.

In February, 2020 as part of follow up he underwent a chest CT which showed a suspicious lymph node in left side of the mediastinum, approximately 2 cm. in diameter and a mass in the left atrium.

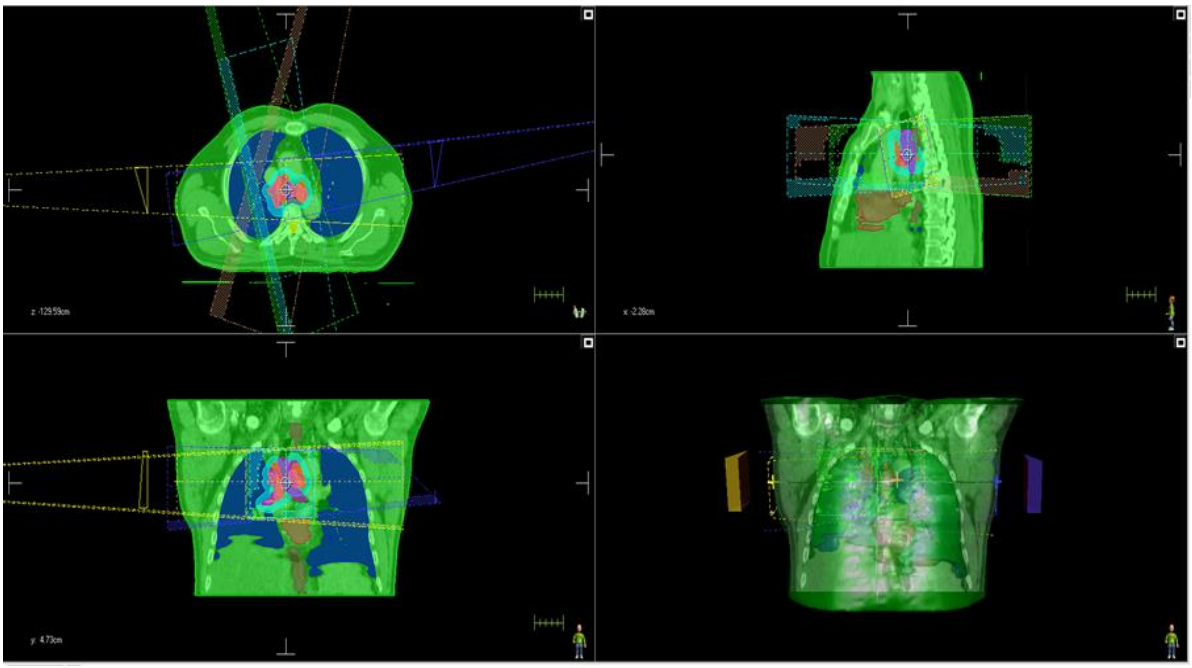

Figure 1: Shows the radiation fields to the mediastinum.

A month later he underwent a total body PET-CT- that showed: Slight hyper-metabolic uptake in the suspicious lymph node in the left side of the mediastinum; Diffuse pulmonary nodules with largest diameter up to 5 mm; A mass in the left atrium.

A multidisciplinary conference including an oncologist, cardio-thoracic surgeons, cardiologist and radiologist came to the conclusion that the atrial mass was most probably a myxoma. Excision was recommended in preference to observation. On review of previous CT and PET-CT scans the mass could be seen on CT from December, 2017, and grew larger on subsequent scans (Figure 2). The cardiac mass was within the mediastinal radiation field. It was felt that the other abnormalities did not represent recurrent disease. Close follow-up was recommended for detection of disease recurrence or additional primary tumours.

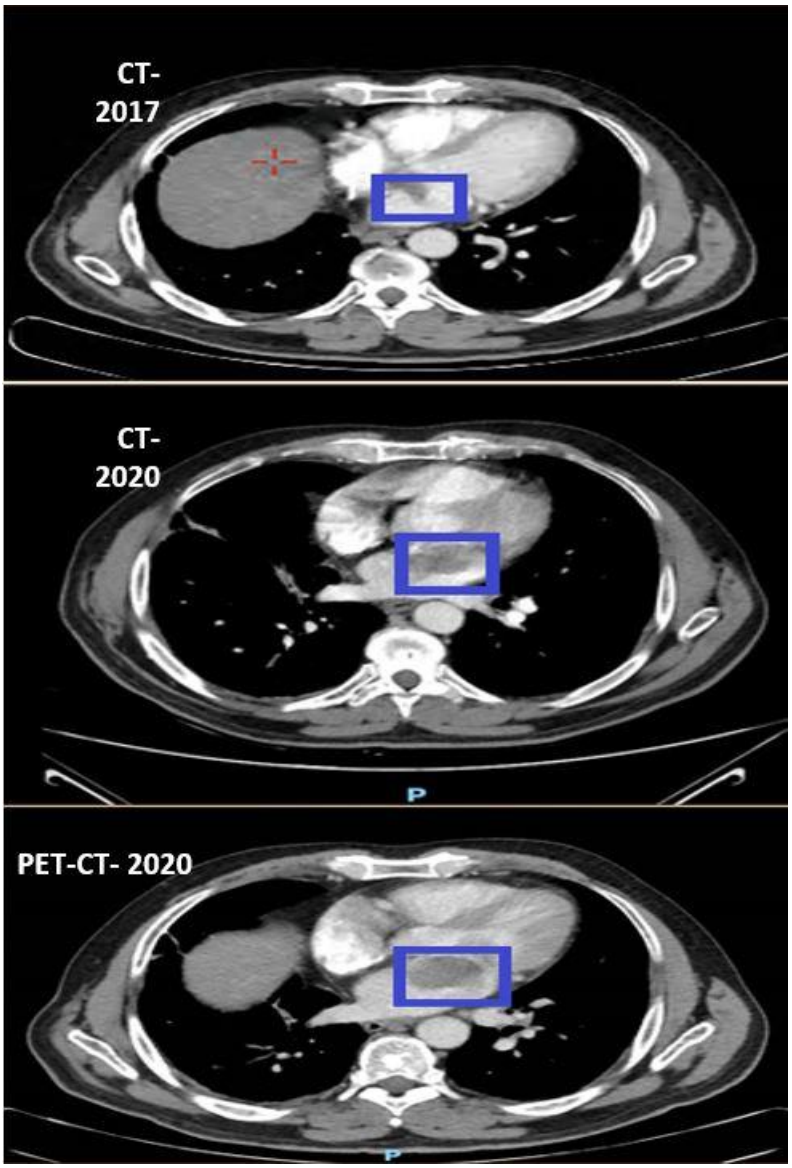

Figure 2: Shows the development of the myxoma since 2017 till removing.

The patient was admitted to the cardiology department for further diagnostic work-up. Electrocardiography showed normal sinus rhythm. Echocardiogram showed a huge left atrial mass 3.6 × 4.2 cm, highly suspicious for a myxoma (Figure 3), that was attached to the inter atrial septum. There was mild mitral stenosis, normal Left Ventricle (LV) systolic function with an ejection fraction of 60 %, good right ventricle function, mild to moderate tricuspid regurgitation and severe pulmonary hypertension. Coronary angiography was performed which revealed normal coronaries.

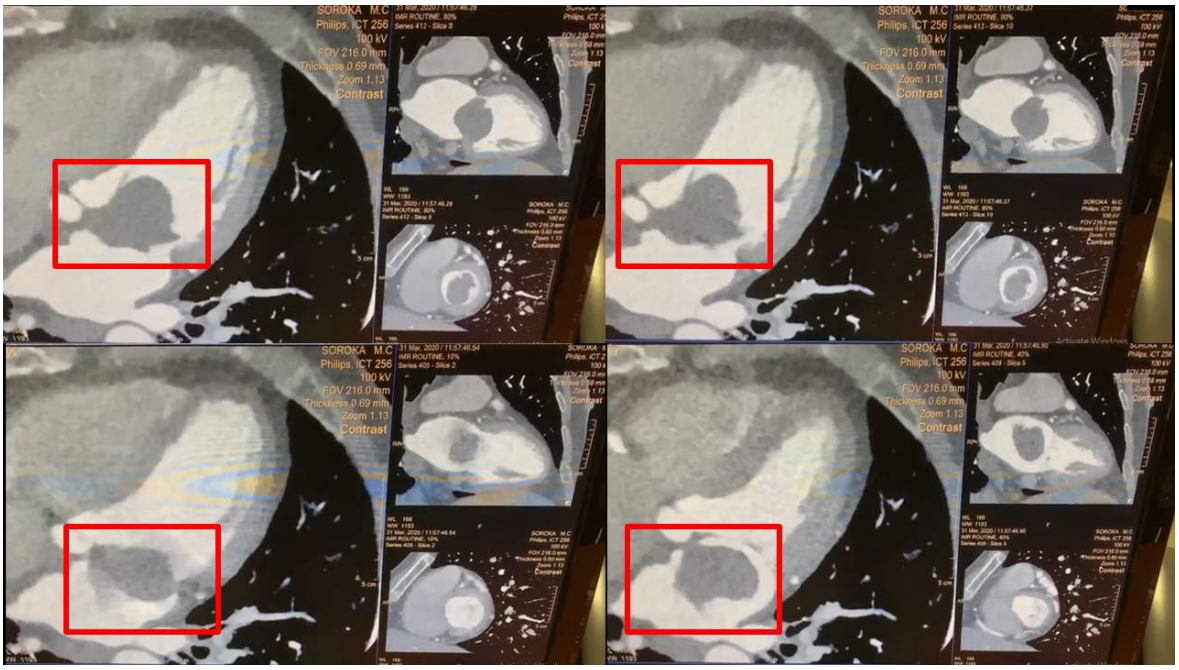

Figure 3: Shows large left atrial mass (inside the red squares) 3.6 × 4.2 cm attached to inter atrial septum due to echocardiogram test.

On April 6, 2020 the patient was admitted to the cardio-thoracic surgery department. He underwent total excision of the cardiac mass (Figure 4), without any complications. Pathologic results showed myxoma.

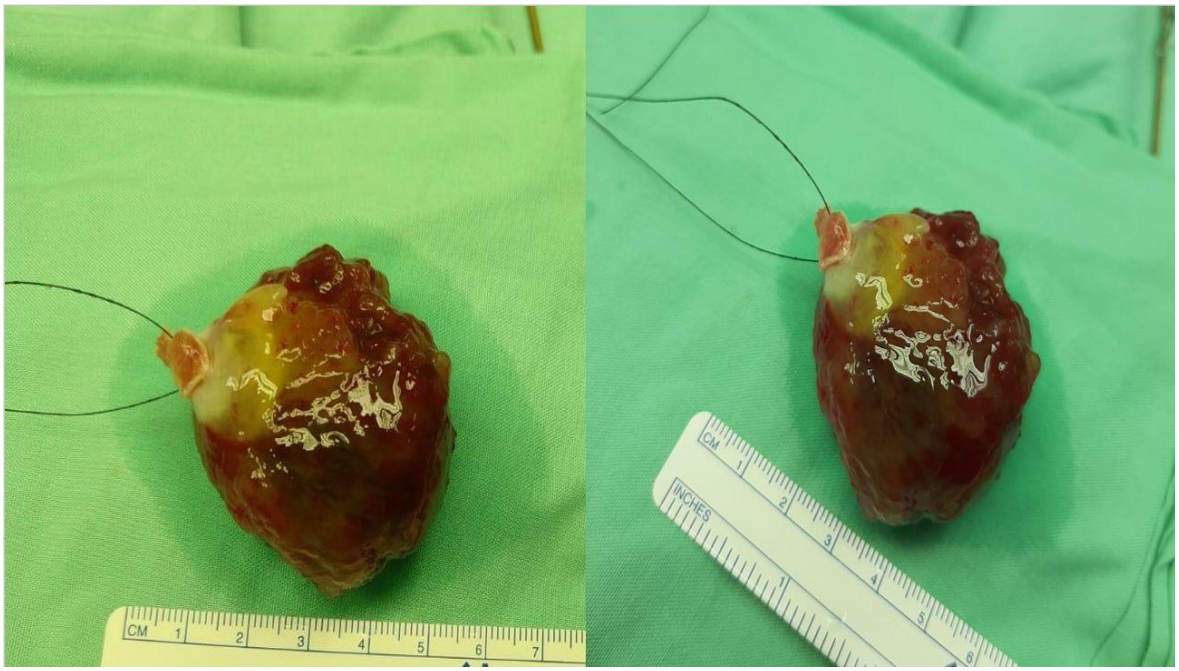

Figure 4: Shows the excised myxoma-pathological specimen.

Discussion and Conclusion

We have described a patient who had an atrial myxoma, a very rare type of benign tumor located in the heart. Myxoma are not known to be associated with other malignancies whether active or in remission.

Eight years previously, the patient had a complete response of the underlying locally advanced lung cancer to concurrent chemo-radiotherapy. During a subsequent work-up for suspected recurrence of lung cancer, the atrial myxoma was diagnosed in the previously irradiated mediastinal field.

The association in this case between the myxoma and radiation maybe coincidental, however there is some basis for speculating that there is a correlation with the previous radiation. Cardiac myxoma cells may result from adult developmental remnants subjected to mitogenic stimuli. A study has suggested that radiation exposure during radiofrequency ablation for supraventricular tachycardia could result in a small increase in the lifetime risk of developing neoplasms [9]. Moreover, heart trauma and subsequent local inflammation have been hypothesized to cause myxoma development [10]. Two mitogenic factors associated with radiotherapy potentially able to induce a myxoma growth are radiation and heart tissue trauma. Moreover, our patient wasn't compatible with traumatic, infectious or degenerative etiology. Thus, after retrospective research we concluded that etiology was radiotherapy induced atrial damage. Follow up is very important for patients in remission from malignant tumors not just to detect recurrences of the primary tumor but also to diagnose second neoplasms. To the best of our knowledge, this is the first report of an atrial myxoma that occurred in a previously irradiated field. It is crucial to be alert to the possibility of a new primary tumor, even a rare type such as in this case, to avoid misdiagnosing it as a recurrence of the original malignant disease.

Acknowledgements

The authors thank David B. Geffen, MD for his critical review of the manuscript. Walid Shalataa* and Ismaell Massalhaa* has contributed equally to this work.

REFERENCES

1. ElBardissi AW, Dearani JA, Daly RC, et al. Analysis of benign ventricular tumors: Long-term outcome after resection. J Thorac Cardiovas Surg. 2008; 135: 1061-1068.
2. Rahouma M, Arisha MJ, Elmously A, et al. Cardiac tumors prevalence and mortality: A systematic review and meta-analysis. Int J Surg. 2020; 76: 178-189.
3. Gosev I, Paic F, Crossed D, et al. Cardiac myxoma the great imitators: Comprehensive histopathological and molecular approach. Int J Cardiol. 2013; 164: 7-20.
4. Zhang P, Meng X, Xia L, et al. Non-small cell lung cancer with concomitant intramuscular myxoma of the right psoas mimicking intramuscular metastasis: A case report and literature review. Oncology Letters. 2015; 10: 3059-3063.
5. Latifi AN, Ibe U, Gnanaraj J. A case report of atrial myxoma presenting with systemic embolization and myocardial infarction. Europ Heart J-Case Rep. 2019; 3: 1-5.
6. Espinola ZN, Lozoya JJ, Colin LL, et al. Left atrial cardiac myxoma. Two unusual cases studied by 3D echocardiography. BMJ Case Rep. 2014; 2014: 2-5.
7. Nasim F, Sabath BF, Eapen GA. Lung Cancer. Medical Clinics of North America. 2019.
8. Bussani R, De-Giorgio F, Abbate A, et al. Cardiac metastases. J Clin Pathol. 2007; 60: 27-34.

9. Kovoor P, Ricciardello M, Collins L, et al. Risk to patients from radiation associated with radiofrequency ablation for supraventricular tachycardia. Circulation. 1998; 98: 1534-1540.
10. Zhang F, Yang B, Chen H, et al. Myocardial injury resulting from radiofrequency catheter ablation: Comparison of circumferential pulmonary vein isolation and complex fractionated atrial electrograms ablation. Chinese Med J. 2011; 124: 2674-2677.