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## Case Report

# Myocardial metastasis within lipomatous hypertrophy of the interatrial septum <sup>☆</sup>

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## ABSTRACT

A 74-year-old lady with lipomatous hypertrophy of the interatrial septum presented with symptomatic anemia. Imaging revealed a new diagnosis of metastatic cancer of presumed lung origin, with a new soft tissue myocardial lesion adjacent to the right atrium within the region of lipomatous hypertrophy. This was favored to represent a myocardial metastasis within concurrent lipomatous hypertrophy of the interatrial septum.

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## Introduction

Lipomatous hypertrophy of the interatrial septum (LHIS) is a condition characterized by benign fatty infiltration of the cardiac interatrial septum. Although it typically presents as an incidental finding and is commonly asymptomatic, LHIS remains under-recognized and can be mistaken for more sinister cardiac lesions including malignancy [1]. Consequently, multimodality imaging and subsequent correlation are recommended in an attempt to reduce misdiagnoses. We present

a case of myocardial metastasis from a lung primary within concurrent lipomatous hypertrophy of the interatrial septum.

## Case presentation

A 74-year-old lady with a background history of presumed myelodysplastic syndrome (MDS) presented with dyspnea.

A contrast-enhanced computed tomography (CT) examination was performed which demonstrated a large, spiculated right middle lobe mass suspicious for a primary lung

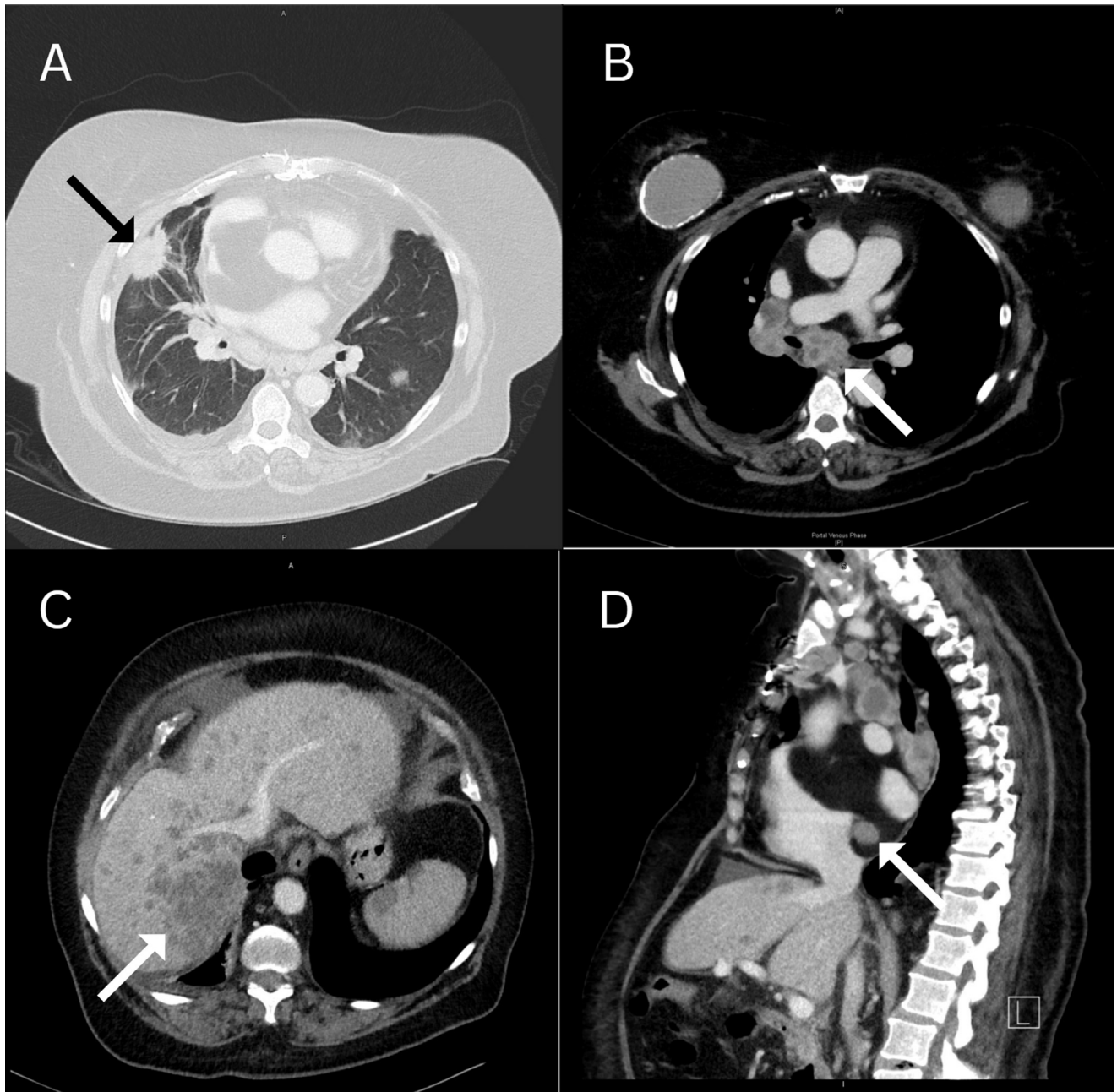
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**Fig. 1** – Computed tomography scans demonstrate the presence of a spiculated right middle lobe pulmonary parenchymal mass (black arrow, A) suspicious of a primary lung malignancy. There are enlarged mediastinal necrotic lymph nodes (white arrow, B) as well as multiple hypodense hepatic lesions (white arrow, C), favored to represent nodal and hepatic metastases. There is a myocardial soft tissue lesion seen adjacent to the right atrium within fatty tissue (white arrow, D).

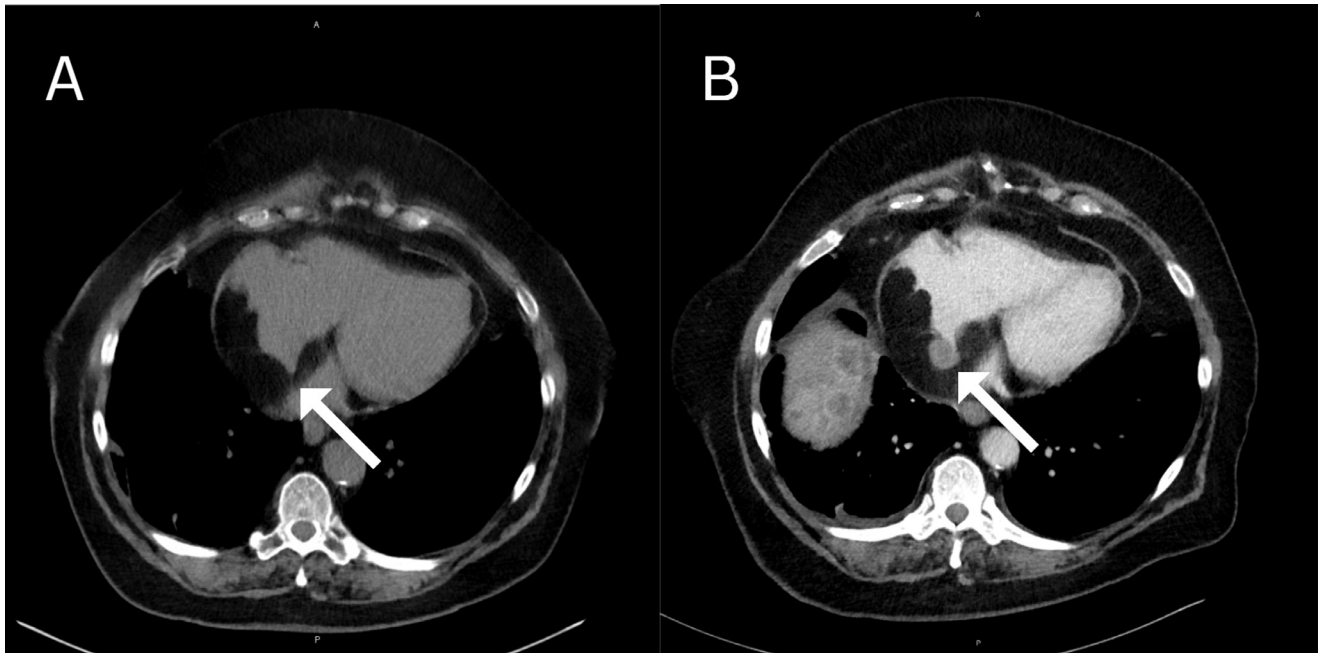
neoplasm (Fig. 1A). There were also several enlarged mediastinal lymph nodes with central necrosis (Fig. 1B) and multiple hypodense liver lesions (Fig. 1C) compatible with nodal and hepatic metastases. In the heart, there was a new ovoid soft tissue lesion within a region of fatty density seen in the myocardium adjacent to the right atrium (Fig. 1D and Fig. 2B). This was associated with nonspecific elevated tumor markers Ca-125 (44.0 kU/L), Ca 19.9 (73.0 kU/L), and CEA (70.8 ug/L).

Further interrogation of her medical history revealed that she had undergone noncontrast imaging of the chest 1 year

prior for an unrelated presentation which revealed incidental fat density interposed between the 2 cardiac atria (Fig. 2A). This was compatible with lipomatous hypertrophy of the interatrial septum.

Since this new soft tissue myocardial lesion had developed over the course of 1 year (Fig. 2A and Fig. 2B), this was favored to represent a myocardial metastasis within lipomatous hypertrophy of the interatrial septum.

Her case was discussed within a multidisciplinary oncology-radiology meeting where the decision was made to



**Fig. 2 – Axial noncontrast chest CT from 1 year prior demonstrates lipomatous hypertrophy of the interatrial septum (white arrow, A). Side-by-side comparison to the axial contrast-enhanced chest CT 1 year after demonstrates interval development of the new myocardial soft tissue lesion within the pre-existing LHIS (white arrow, B).**

not pursue further invasive investigation and potential systemic therapy in the context of pre-existing poor functional status and medical comorbidities.

## Discussion

Lipomatous hypertrophy of the interatrial septum (LHIS) is a benign incidental finding which is characterized morphologically by a nonencapsulated mass of fatty tissue within the atrial septum typically sparing the fossa ovalis, first described by Prior in 1964 [2]. Although lipomatous hypertrophy itself is not a malignant process, diagnostic differentials of LHIS include neoplastic lesions such as lipomas, rhabdomyomas, myxomas, rhabdomyosarcomas, and liposarcomas. It is defined histologically by the presence of fat infiltration of myocardial fibers and hyperplasia of adipocytes [3]. Although typically asymptomatic, rare complications of LHIS include arrhythmia, superior vena cava syndrome, and sudden cardiac death [4]. Whilst the estimated prevalence of LHIS is 1%–8% [5], it remains under-recognized and can be mistaken for a cardiac malignancy—multimodality imaging is thus recommended for characterization of cardiac lesions in order to reduce misdiagnoses. The likelihood of a myocardial metastasis depositing within lipomatous hypertrophy of the interatrial septum is extremely uncommon, adding further complexity to the diagnostic workup. There is no reported predisposition for metastatic deposition within LHIS.

In our case, serial CT examination demonstrating the development of the soft tissue myocardial lesion over a 1-year period was favored to represent a metastatic deposit. Routine multimodality characterization of cardiac lesions typically in-

cludes CT, FDG-PET, MRI, or a combination of these modalities. However, the presence of metastasis within LHIS may pose a diagnostic dilemma with regards to further investigation with a nuclear medicine FDG PET/CT study—LHIS has been documented in the literature to demonstrate increased FDG-18 avidity [6,7]. The mechanism of how this occurs is currently disputed, with proposed theories including the presence of cardiomyocytes contained within the LHIS, metabolically active brown adipose tissue, or an underlying element of inflammation [8]. Consequently, metabolically active FDG avidity seen within a myocardial lesion cannot be confidently attributed to either a malignant process or underlying LHIS. As a result, FDG-PET has less utility in determining the suspicion of malignancy, and additional imaging modalities may be required.

On multisequence gadolinium-enhanced cardiac MRI, LHIS appears as a well-defined bi-lobe mass of homogenous high signal intensity on T1-weighted and T2-weighted images, characteristic of fat. In addition, LHIS will demonstrate a signal dropout on fat suppression sequences and nonenhancement with gadolinium, both in keeping with fatty infiltration [9]. In comparison, cardiac metastases typically would demonstrate low signal intensity on T1-weighted images, high signal intensity on T2-weighted images as well as internal gadolinium enhancement [10–12]. Whilst no MRI scans were performed in our case, it is important to recognize the utility of MRI as a means of further characterization of cardiac lesions, particularly if they are complex and comprised of multiple entities.

Ultimately, a combination of CT, FDG-PET, and MRI is recommended for optimal characterization of a cardiac lesion, particularly when multifarious in nature.

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## Conclusion

This report demonstrates the unusual case of a suspected metastatic lesion depositing within a pre-existing lipomatous hypertrophied interatrial septum. When encountering a complex cardiac lesion, close comparison with serial imaging as well as multimodality imaging is crucial for further investigation and characterization.

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## Patient consent

Personal patient information was removed from the presented radiology images and appropriate patient consent was obtained.

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