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## A confusing lesion: pulmonary Inflammatory Myofibroblast Tumour

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## **Abstract**

Inflammatory Myofibroblastic Tumours (IMT), also known as plasma cell granuloma, is a mesenchymal neoplasm that can be observed in almost every tissue. IMT is very rare with an incidence of approximately 0.04-1% of all pulmonary masses in adults. In children, it is the most common primary mass of the lung. Imaging findings of IMT are variable and nonspecific, probably due to fibrosis and cellular infiltration. They can cause difficulties in the diagnostic process due to differences in imaging characteristics.

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## Introduction

Inflammatory Myofibroblastic Tumours (IMT), also known as plasma cell granuloma, is a mesenchymal neoplasm that can be observed in almost every tissue.<sup>1,2</sup> IMT is very rare with an incidence of approximately 0.04-1% of all pulmonary masses in adults.<sup>2,3</sup> In children, it is the most common primary mass of the lung.<sup>1,4</sup> Imaging findings of IMT are variable and nonspecific, probably due to fibrosis and cellular infiltration.<sup>5</sup> They can cause difficulties in the diagnostic process due to differences in imaging characteristics.<sup>6</sup>

## Case Report

A 62-year-old male patient was evaluated with abdominal Magnetic Resonance Imaging (MRI) after a mass lesion was detected in the lower pole of the left kidney on sonographic examination due to abdominal pain. MRI showed a heterogeneous hyperintense mass with T2A cystic degenerative changes in the lower pole of the left kidney, which was markedly contrasted after gadolinium-based contrast (Figure 1). The lesion was considered as clear cell Renal Cell Carcinoma (RCC) in the foreground. The diagnosis was confirmed pathologically. Abdominal MRI showed a mass in the lower lobe of the right lung with a heterogeneous signal on the T2A image and a circumferential contrast-enhancing mass on the contrast-enhanced series (Figure 2). A chest Computed Tomography (CT) scan revealed a 32x28 mm irregularly circumscribed heterogeneous dense mass with calcification (Figure 3). On the whole-body F-18 Fluorodeoxyglucose (FDG) Positron Emission Tomography (PET/CT), the lesion had a high focal FDG-uptake (Maximum Standardized Uptake Value, SUVmax, 4.2 g/mL) (Figure 4). The

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patient had a right lower lobectomy. The pathological result was an inflammatory myofibroblastic tumour of the lung.

## Discussion

IMT of the lung is a spindle cell proliferation of unknown aetiology which is frequently observed in paediatric age group.<sup>1</sup> They are mostly asymptomatic and diagnosed incidentally.<sup>6</sup> Rarely, it may cause airway obstruction and cause obstructive respiratory symptoms.<sup>2</sup> It mimics invasive malignant tumours clinically and radiologically.<sup>7</sup>

IMT is a neoplasia resulting from acute or chronic inflammation, histologically containing lymphocytes, plasma cells, myofibroblastic spindle cells, and collagen.<sup>5</sup> There are noninvasive and invasive subtypes. Invasive subtypes can reach large sizes and are seen in younger patients.<sup>1,3</sup> ALK-1 immunopositivity is seen in approximately 50% of cases, especially in children and young adults.<sup>1,5</sup> ALK-positive tumours have a better prognosis. The risk of distant metastasis and mortality is high in ALK-negative tumours.<sup>7,8</sup>

Radiological findings vary depending on the presence of cellular infiltration and fibrosis.<sup>5</sup> IMT in the lung can be seen as a solitary nodule with lobule contour, often located in the lower lobe, or as masses reaching large sizes. The lesion may contain calcification and calcification is more common in children than in adults. Calcifications may be amorphous, mixed, fine speckle-like, or dense coarse calcifications.<sup>5,6</sup> Multiple nodules and endobronchial lesions may be observed more rarely. About 10% of patients may develop atelectasis and pleural effusion.<sup>1</sup> On MRI, they have intermediate signal intensity on T1-weighted images and hyperintense signal on T2-weighted images. They show enhancement with gadolinium-based contrast.<sup>5</sup>

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IMT may show increased metabolic activity on FDG PET/CT scan. This makes it difficult to distinguish IMT from other neoplasms.<sup>1,3,5</sup>

Although IMTs are generally considered to be lesions of benign origin, their clinical behaviour is variable and they may show malignant transformation associated with locally invasive, recurrent, and metastatic disease.<sup>1,2</sup> Treatment depends on the size, location, and spread of the tumour. In general, surgical resection is recommended if possible for long-term survival.<sup>7</sup>

The differential diagnosis of the lesion includes malignant processes such as primary lung cancer and metastases, as well as many benign lesions such as cryptogenic organising pneumonia and hamartoma.<sup>5,6</sup> The FDG-PET/CT scan was performed with suspicion of metastasis or primary lung cancer because our patient also had a primary malignancy. The lesion was excised when the standardised value was found to be high.

## **Conclusions**

IMT is a rare lung lesion in adults and can be confused with malignant processes. It should be considered in the differential diagnosis of lung lesions, especially in patients with a primary malignancy, to avoid delays in diagnosis and treatment.

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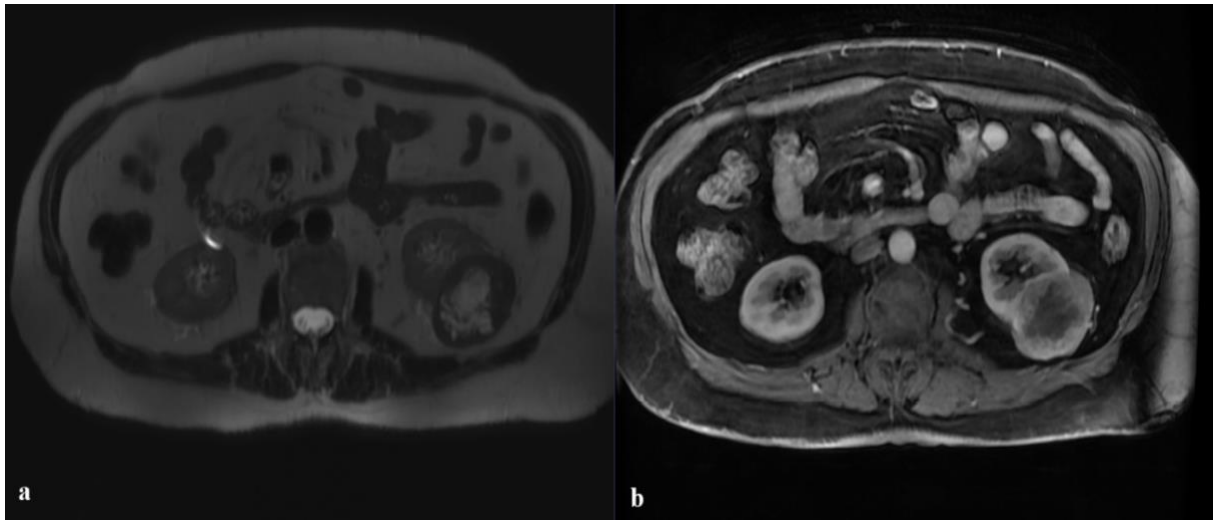
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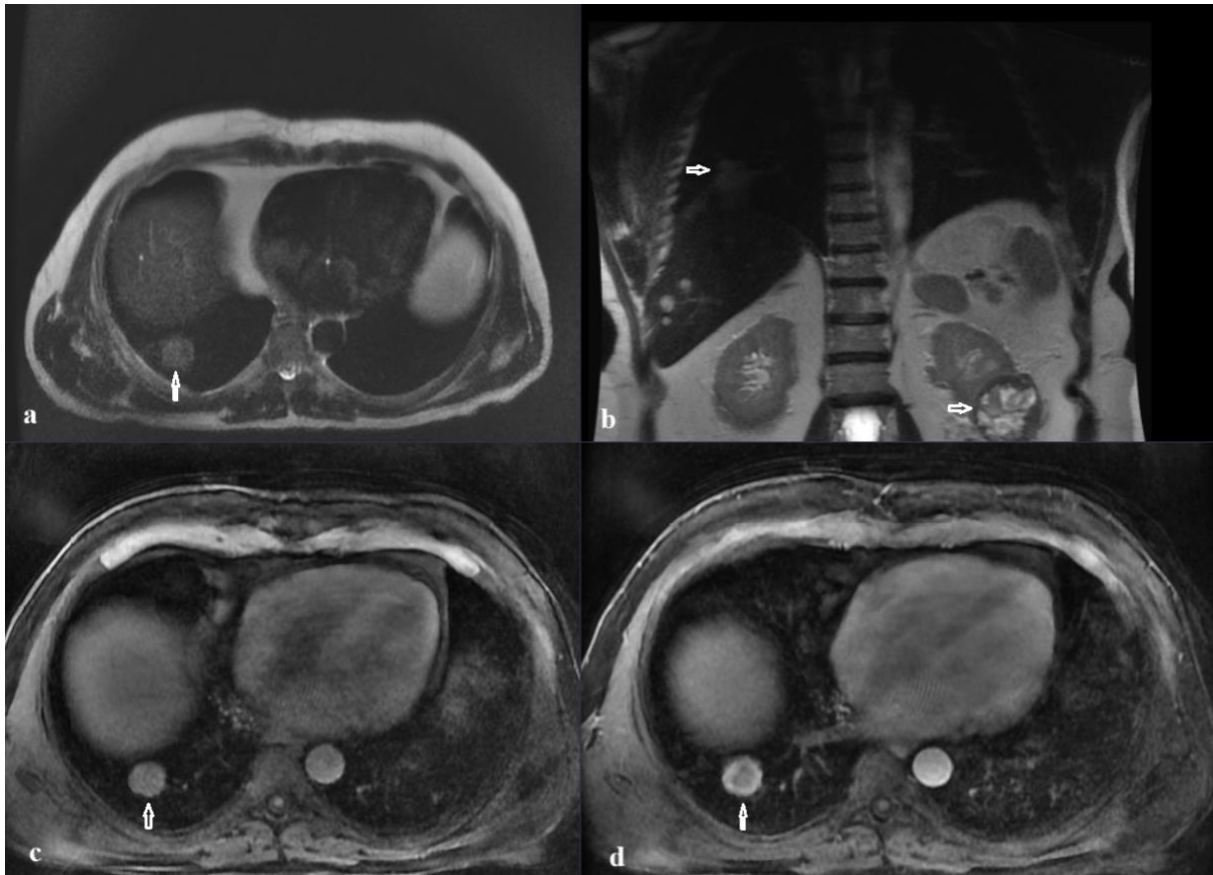
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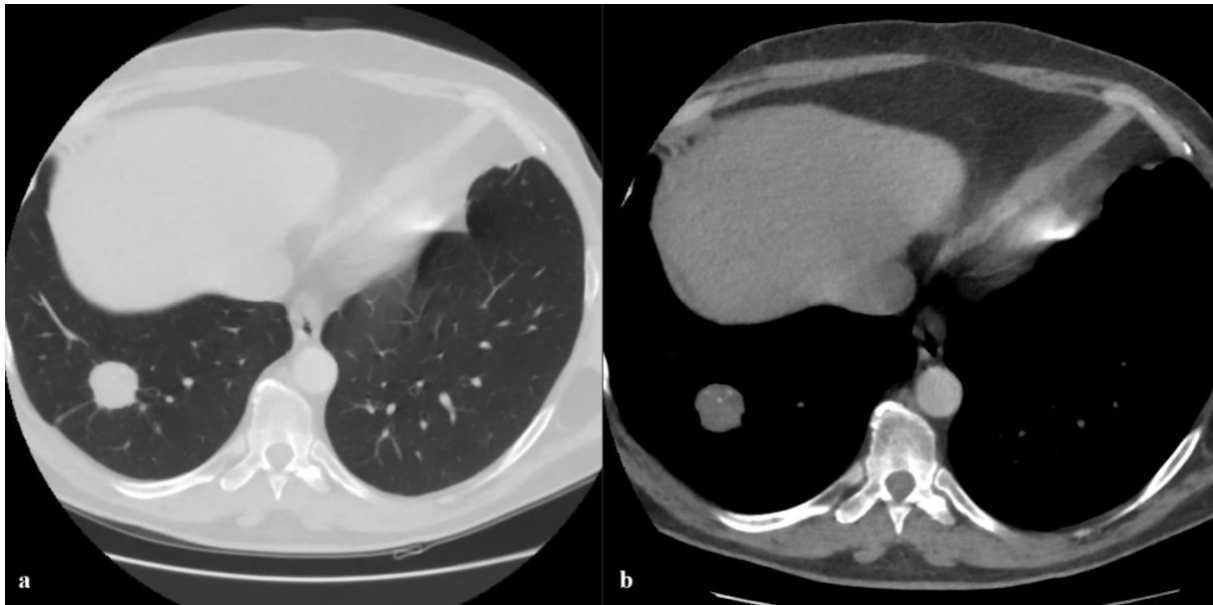




**Figure 1.** a) Axial T2WI shows a heterogeneous signal mass with cystic degenerated areas in the lower pole of the left kidney, b) the lesion is heterogeneously enhanced after contrast material injection.

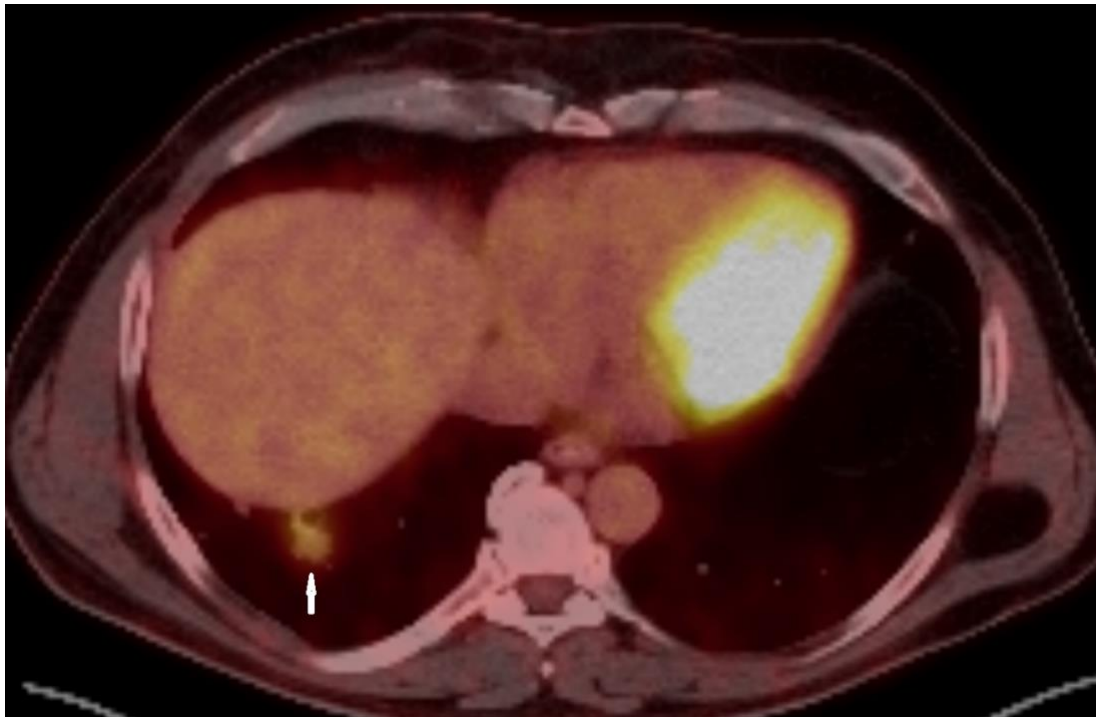


**Figure 2.** a) In the thorax sections included in the abdominal MRI examination, a lesion with heterogeneous signal intensity on T2WI in the lower lobe of the right lung is noted, b) Coronal image showing the lesion in the right lung and left kidney, c,d) When non-contrast fat-suppressed T1 and contrast-enhanced examination is evaluated, it is seen that the lesion in the lung is peripherally enhanced.



**Figure 3. a,b)** Non-contrast chest Computed Tomography (CT) shows an irregular marginated mass with millimetric calcification in the lower lobe of the right lung.

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**Figure 4.** Positron Emission Tomography (PET/CT) shows high Fluorodeoxyglucose (FDG) uptake in the lesion.

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