

# Phosphoglyceride crystal deposition disease mimicking a malignant tumor

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## ABSTRACT

A 45-year-old woman who had undergone surgical repair for an atrial septal defect at the age of 7 years presented with multiple anterior mediastinal masses. Positron-emission tomography (PET) with 2-[<sup>18</sup>F]fluoro-2-deoxy-D-glucose (FDG) revealed high uptake in the masses. The findings were interpreted as mediastinal malignant tumors with dissemination. Biopsy was performed, and the histological diagnosis was phosphoglyceride crystal deposition disease without neoplastic changes. Although phosphoglyceride crystal deposition disease is rare, it should be recognized as a potential interpretive pitfall that mimics a malignant tumor in FDG-PET findings in a patient after cardiac surgery.

## 1. Introduction

Phosphoglyceride crystal deposition disease is defined as deposition of crystals of the phospholipid phosphoglyceride. This disease tends to occur at the sites of invasive procedures, including surgical sites [1,2]. We herein report a 45-year-old-woman presenting with multiple anterior mediastinal masses that were diagnosed as phosphoglyceride deposits. We also conducted a literature review of clinical and imaging findings for phosphoglyceride crystal deposition disease. The imaging findings for phosphoglyceride crystal deposition disease are generally limited availability. It is an extremely rare disease, but clinicians should consider it as a differential diagnosis for masses generated at surgical sites. In this report, we describe the clinical and imaging features of the disease.

## 2. Case presentation

A 45-year-old Japanese woman was referred with a strange feeling in her left shoulder. She had a history of surgical repair of an atrial septal defect at the age of 7 years. The levels of serum tumor markers (carcinoembryonic antigen and carbohydrate antigen 19-9) were within normal limits. No eyelid ptosis or multiple visions were observed. A negative result was obtained for the acetylcholine receptor antibody test. Contrast-enhanced computed tomography (CT) showed 2 masses with partial calcification, located in the anterior mediastinum. The 2 masses showed homogeneous enhancement. They measured 9 × 6 × 4 cm and 2.5 × 1.5 × 2.0 cm (Fig. 1a, b). On magnetic resonance imaging (MRI), a T1-weighted image (T1WI) demonstrated a

well-defined isointense mass (Fig. 2a, b). A T2-weighted image (T2WI) demonstrated a mixture of isointense and hyperintense areas (Fig. 2c, d).

Positron-emission tomography (PET) with 2-[<sup>18</sup>F]fluoro-2-deoxy-D-glucose (FDG) images revealed uptake in the 2 masses (Fig. 3a, b). The maximum standardized uptake values (SUV) of the 2 lesions were 26.0 and 13.6. Other signs of abnormal uptake suggesting a malignant lesion were not observed.

The findings were interpreted as mediastinal malignant tumors with dissemination. After obtaining informed consent, we performed a biopsy on the larger mass, under CT guidance. Histologically, the biopsy specimen showed a foreign body granuloma featuring deposition of many small crystals and foreign-body giant cells. Under polarized light, the deposited materials appeared as string-like crystals and appeared to be refractive (Fig. 4).

Immunohistochemistry identified histiocytes and multinucleated giant cells, which were positive for vimentin and CD68. Based on these findings, the tumors were diagnosed as resulting from phosphoglyceride crystal deposition. Because there was no evidence of neoplasia, the patient refused to permit resection of the masses. She did not receive any further treatment. Two years later, the size of the masses had not changed, and there was no exacerbation of her symptoms.

## 3. Imaging protocol

### 3.1. CT imaging protocol

CT of the chest were performed using a 64-detector row CT machine

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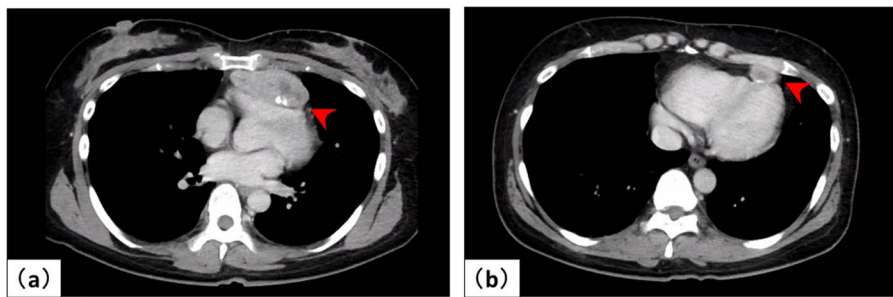


Fig. 1. A 45-year-old woman presenting with multiple anterior mediastinal masses. (a, b) On contrast-enhanced computed tomography (CT), the masses demonstrated homogeneous enhancement with partial calcification (arrowheads).

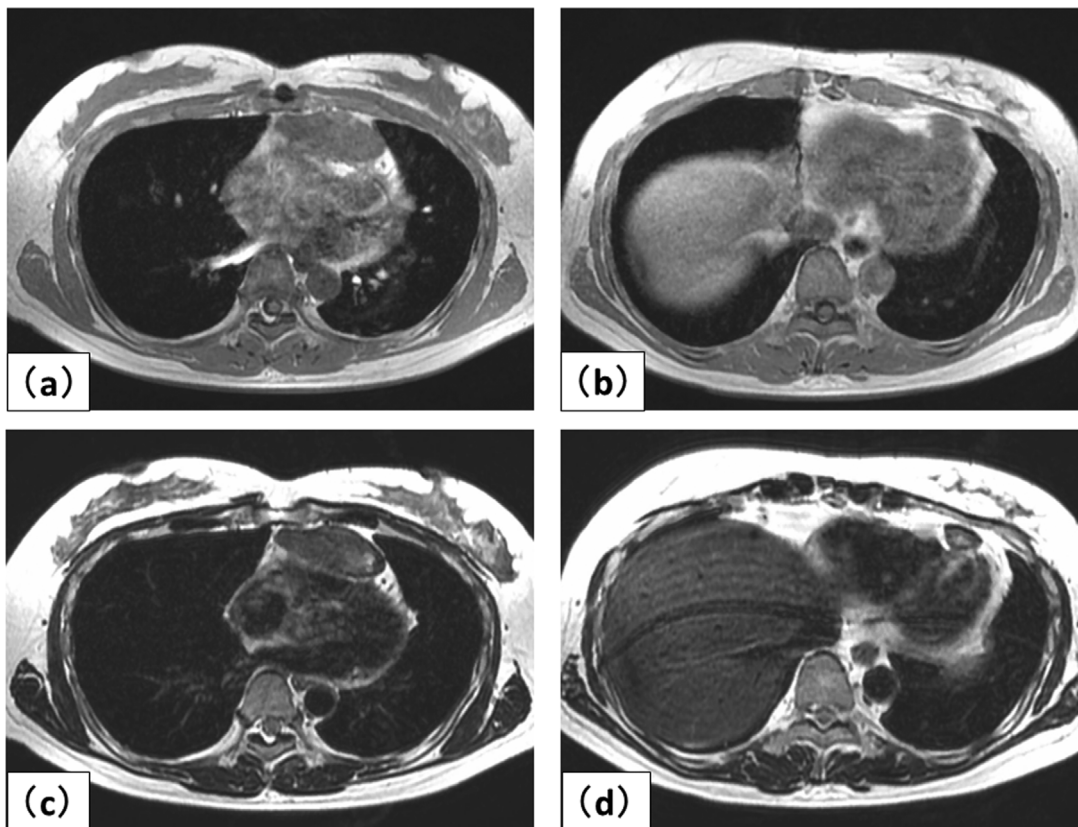


Fig. 2. Magnetic resonance imaging (MRI) findings. (a) A T1-weighted image (T1WI) demonstrated a well-defined isointense mass. (b) A T2-weighted image (T2WI) demonstrated a mixture of isointense and hyperintense areas.

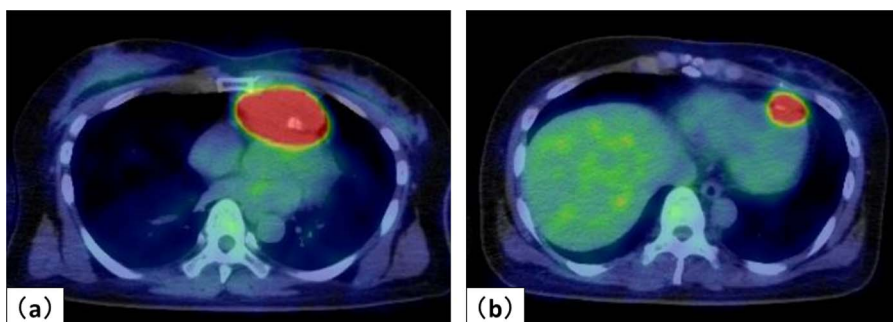


Fig. 3. FDG-PET images showed uptake in the 2 masses. The maximum standardized uptake value (SUV) of 2 lesions were (a) 26.0 and (b) 13.6.

(Aquilion 64, Toshiba Medical System, Tokyo, Japan). Contrast-enhanced CT has been performed after an intravenous bolus injection of 100 ml nonionic iodinated contrast media (iopamidol, 300 mg I/ml; Iopamiron, Bayer Yakuhin, Tokyo, Japan) at a rate of 3 ml/s. Scanning was initiated approximately 60 s after the initiation of the bolus injection of contrast media. Scanning parameters as follows: tube voltage, 120 kV; tube current, 250 mAs; rotation time, 0.358 s; field of view,

400 mm; reconstruction interval, 1 mm; slice thickness, 0.8 mm.

### 3.2. MR imaging protocol

MRI was performed using the 1.5-T superconductive system (Avanto; Siemens Medical Systems, Erlangen, Germany) with an eight-channel body matrix coil and a spine matrix coil. T1WI was acquired

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