

F-18 FDG PET/CT images of a rare primer cardiac tumour: Primary Pericardial Mesothelioma

İlknur Ak Sivriköz, Hasan Öner, Emine Kasapoğlu Dünder*, Yüksel Çavuşoğlu**, Sadettin Dernek***

Departments of Nuclear Medicine, *Pathology, **Cardiology, ***Cardiovascular Surgery, Faculty of Medicine, Eskişehir Osmangazi University; Eskişehir-Turkey

Introduction

Primary pericardial mesothelioma (PPM) is an uncommon variety of primary malignant cardio-pericardial tumor and is a highly lethal and an extremely rare cardiac tumor (1). Its incidence was 0.0022% among 500,000 cases in a large necropsy study (2). It has poor prognosis and a progressive clinical course. Common clinical features are constrictive pericarditis, cardiac tamponade, and cardiac failure. Prognosis is poor with survival after diagnosis ranging from 6 weeks to 15 months (3). The diagnosis of PPM is extremely difficult because its clinical presentation is nonspecific. Here we report the F-18 fluorodeoxyglucose positron emission Tomography (F-18 FDG PET)/computed tomography (CT) images of a patient with PPM.

Case Report

A 54-year-old man presented to our hospital with a 4-month history of intermittent shortness of breath. Transthoracic echocardiography revealed a mild pericardial effusion and minimal pericardial thickening. CT image of the thorax showed fluid collections within the pericardial sleeves (up to 14 mm) and the bilateral pleural spaces (Fig. 1). He had no apparent history of oc-

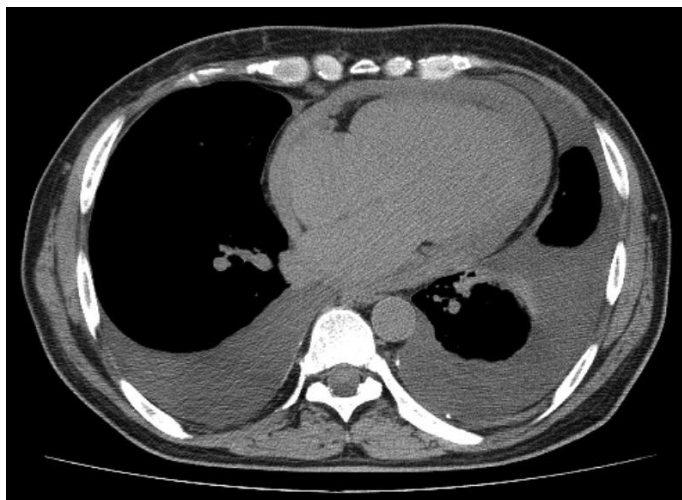


Figure 1. Transaxial CT image of the thorax shows the fluid collections within the pericardial sleeves (up to 14 mm) and bilateral pleural spaces

cupational exposure to asbestos. Although CT scan of the chest and echocardiography were performed, a definitive diagnosis could not be obtained. Whole body F-18 FDG PET/CT scan was performed (1 h after the administration of 465 MBq F-18 FDG, with the subject fasted for 6 h beforehand). FDG-PET/CT images showed a diffuse intense F-18 FDG uptake (SUVmax, 7.5) in the thickened pericardium (Fig. 2, Video 1). There were fluid collections within the bilateral pleural spaces and massive fluid in the abdominal and pelvic peritoneal spaces and systemic edema. No abnormal focus of FDG uptake was seen elsewhere in the body, suggesting a possible site of primary. Thus, a primary tumor of the pericardium, possibly malignant PPM was suspected. In addition, there were no additional hypermetabolic lesions suggesting lymphatic or distant metastatic disease. Primary pericardial malignancy as the cause of constrictive pericarditis was highly suspected from F-18 FDG PET/CT results. The patient's condition deteriorated, and surgical pericardiectomy under cardiopulmonary bypass (CPB) was performed to relieve the symptoms and confirm the definitive diagnosis. The debulking surgery was performed to remove the thickened pericardium. Pathological examination revealed epithelial type PPM (Fig. 3). He underwent palliative treatment and died 2 months postoperatively.

Discussion

PPMs are extremely rare and have an overall poor prognosis. The onset of symptoms is usually insidious. The majority of physical findings are nonspecific. The diagnosis is extremely difficult because its clinical presentation is nonspecific. The clinical presentation is that of constrictive pericarditis or pericardial effusion with or without tamponade and heart failure caused by myocardial infiltration. It can often be misdiagnosed as other causes of constrictive pericarditis prior to undergoing pericardial tissue biopsy. The cause of this rare tumor is unknown. Ex-

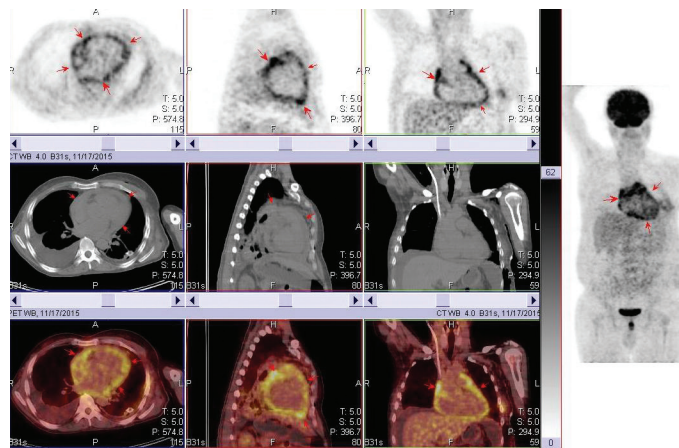


Figure 2. F-18 FDG MIP PET (upper), CT (middle), and fusion PET/CT (lower) images of the thorax show a diffuse intense F-18 FDG uptake (SUVmax, 7.5) in the thickened pericardium. There is fluid collection within the pleural spaces

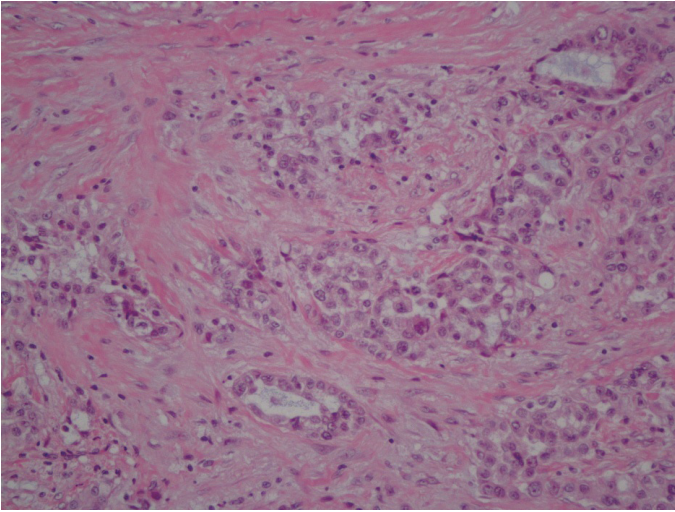


Figure 3. Microscopic appearance of the tumor (H&E stain, x100)

posure to asbestos is correlated with the onset of pleural and peritoneal mesothelioma; a link to asbestos has not been shown. Echocardiography is the most commonly used initial investigative tool. CT and magnetic resonance imaging are useful in showing the extent of involvement of contiguous structures and the degree of constriction. The treatment options for this rare tumor are surgery, radiotherapy, and chemotherapy. Operative intervention in pericardial mesothelioma is primarily for effusion control, cytoreduction before multimodal therapy, or to deliver and monitor innovative intrapericardial therapies (4, 5).

F-18 FDG, an analogue of glucose, provides valuable functional information based on increased glucose uptake and glycolysis of cancer cells and depicts metabolic abnormalities. FDG PET/CT with its ability for whole body fusion imaging is used for detection of primary tumors and distant metastases in most of the cancers, including primary cardiac tumors (6–9). In our case, pericardial malignancy was highly suspected from the imaging results. Absence of abnormal uptake suggests primary malignancy at a distant site in F-18 FDG PET/CT and reinforces the possibility of PPM in these cases. Exact diagnosis of PPM could be established by histopathology. Pleural and peritoneal effusions were the only signs of pericardial constriction.

Conclusion

Primary pericardial malignant mesothelioma is an extremely rare neoplasm. To determine the exact etiology of constrictive pericardial disease, clinical suspicion, imaging modalities, and histopathological examination are needed. F-18 FDG PET scan is useful to evaluate the pericardial metabolic activity in assessing the etiology of constrictive pericardial disease.

Video 1. Whole body F-18 FDG MIP PET images of the patient. A diffuse intense F-18 FDG uptake of heart is seen (video image). Co-registered PET/CT images of thorax showed increased FDG activity of thickened pericardium, Figure 2.

References

1. Papi M, Genestreti G, Tassinari D, Lorenzini P, Serra S, Ricci M, et al. Malignant pericardial mesothelioma. Report of two cases, review of the literature and differential diagnosis. *Tumori* 2005; 91: 276-9.
2. Lagrotteria DD, Tsang B, Elavathil LJ, Tomlinson CW. A case of primary malignant pericardial mesothelioma. *Can J Cardiol* 2005; 21: 185-7.
3. Kralstein J, Frishman W. Malignant pericardial diseases: diagnosis and treatment. *Am Heart J* 1987; 113: 785-90.
4. Wang ZJ, Reddy GP, Gotway MB, Yeh BM, Hetts SW, Higgins CB. CT and MR imaging of pericardial disease. *Radiographics* 2003; 23: S167-80.
5. Sardar MR, Kuntz C, Patel T, Saeed W, Gnall E, Imaizumi S, et al. Primary pericardial mesothelioma unique case and literature review. *Tex Heart Inst J* 2012; 39: 261-4.
6. Puranik AD, Purandare NC, Sawant S, Agrawal A, Shah S, Jatale P, et al. Asymptomatic myocardial metastasis from cancers of upper aero-digestive tract detected on FDG PET/CT: a series of 4 cases. *Cancer Imaging* 2014; 14: 16.
7. Ak I, Çiftçi OD, Üstünel Z, Sivriköz MC. Atrial angiosarcoma imaged by F-18 FDG PET/CT. *Anadolu Kardiyol Derg* 2011; 11: E17.
8. Ost P, Rottey S, Smeets P, Boterberg T, Stragier B, Goethals I. F-18 fluorodeoxyglucose PET/CT scanning in the diagnostic work-up of a primary pericardial mesothelioma: a case report. *J Thorac Imaging* 2008; 23: 35-8.
9. Aga F, Yamamoto Y, Norikane T, Nishiyama Y. A case of primary pericardial mesothelioma detected by 18F-FDG PET/CT. *Clin Nucl Med* 2012; 37: 522-3.

Address for Correspondence: Dr. İlknur Ak
ESOGÜ Tıp Fakültesi Nükleer Tıp Bölümü
26480 Eskişehir-Türkiye
Phone +90 222 239 29 79/3450 Fax: +90 222 229 11 50
E-mail: ilknur_ak@yahoo.com

©Copyright 2016 by Turkish Society of Cardiology - Available online at www.anatoljcardiol.com
DOI:10.14744/AnatolJCardiol.2016.7023



An extremely rare but possible complication of MitraClip: embolization of clip during follow-up

Mehmet Bilge^{1,2}, Yakup Alsancak¹, Sina Ali¹, Mustafa Duran¹, Hasan Biçer²

¹Division of Cardiology, Atatürk Education and Research Hospital; Ankara-Turkey

²Division of Cardiology, Faculty of Medicine, Yıldırım Beyazıt University; Ankara-Turkey

Introduction

Although surgical mitral valve repair or replacement is the treatment of choice for patients with severe mitral regurgitation (MR), up to 50% of these patients are denied surgery due to advanced age, poor left function, or comorbidities (1, 2). Percutaneous mitral valve repair using the MitraClip device (Abbott