A 38-year-old Caucasian male smoker presented with dyspnoea secondary to a large pericardial and moderate left pleural effusion, with elevated serum inflammatory markers and bloody pericardial aspirate. Large-volume fluid samples proved negative for malignancy and acid-fast bacilli, both on first presentation and at recurrence 1 month later. No malignancy was apparent on contrast computed tomography, and treatment with colchicine and prednisolone was initiated. No further re-accumulation was observed at 2 months; serum inflammatory markers had normalized and prednisolone was tapered accordingly. However, new unilateral retro-orbital pain 3 months after initial presentation heralded the finding of a large invasive tumour mass eroding the right petrous temporal bone, with histological identification of angiosarcoma at urgent resection. Re-assessment now by $^{18}$F-FDG/PET-CT exhibited intense tracer activity at the right cardiac atrium (Panel A and B). Further evaluation by cardiac MRI demonstrated a right atrial mass (Panel C; see Supplementary data online, Video S1) and extensive irregular lesions in the pericardial space with myocardial invasion (Panel D and E; see Supplementary data online, Videos S2 and S3). Gadolinium contrast uptake was surprisingly modest, limited primarily to the right atrial mass and the lateral aspect of the left ventricle (Panel F–H; see Supplementary data online, Video S4) with no late gadolinium enhancement. Nonetheless, surgical exploration confirmed extensive invasive and necrotic tumour not amenable to novel treatment with auto-transplantation (Panel I). Histological analysis confirmed Grade III angiosarcoma (Panel J), and the patient died shortly after. Given the significant likelihood of malignancy in the setting of unexplained bloody effusion with tamponade, early consideration of functional imaging is warranted even when anatomical imaging and cytology are ostensibly reassuring.

Conflict of interest: None declared.

Supplementary data are available at European Heart Journal — Cardiovascular Imaging online.