Pulsus paradoxus due to a tumorous mass constricting the heart

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A 54-year-old man was transferred to our cardiology department from a secondary centre in July 2015 due to progressive dyspnoea. Thoracic computed tomography showed pericardial effusion with a maximal end-diastolic separation of 30 mm (Panels A and B, star) surrounded by a nodular contrast-enhanced tumour mass constricting the right and left ventricle (Panels A and B, arrows) and the superior vena cava (Panel A, arrowhead). Pericardial drainage and CT-guided biopsy of paracardiac lymph nodes were performed. Histological and immunohistochemical analyses revealed a sclerotic tumour formation lacking any specific tissue characteristics. For further diagnostic workup, the patient was subsequently transferred to the oncology ward.

Eight days thereafter the patient was admitted to the ICU because of progressive haemodynamic impairment. Invasive haemodynamic monitoring showed pronounced pulsus paradoxus (Panel C, arrow: inspiration; arrowhead: expiration). This finding and new-onset low QRS voltage on ECG from 30 July compared with 22 June suggested progressive pericardial effusion. Unexpectedly, echocardiography revealed extensive progression of pericardial tumour mass rather than pericardial effusion. According to a decision of the heart team, thoracotomy was performed the next day to provide relief from cardiac constriction and to gain information about the origin of the tumorous mass. Cardiac surgery revealed extensive tumour mass infiltrating both the left pulmonary hilum and the pericardium, thereby causing constriction of the right and left ventricle. Because of the infiltrative tumour expansion, complete resection could not be achieved. Histology from tumour revealed a sarcomatous mesothelioma. The patient died 7 days later from progressive cardio-pulmonary failure.

Panels A and B: Thoracic CT scan showing pericardial effusion (star) and the infiltrating tumour mass (arrows). Compression of the superior vena cava (arrowhead). Panel C: Invasive assessment of arterial blood pressure curves showed pulsus paradoxus (arrow: inspiration; arrowhead: expiration).