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Advanced malignant mesothelioma mimicking acute contained thoracic aortic rupture

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Abstract

In the emergent setting, patients presenting with acute interscapular pain along with haemodynamic instability require immediate evaluation. We describe the case of a patient in which computed tomographic scanning demonstrated a large hyper-dense, periaortic collection on post-contrast imaging. Urgent endovascular repair was performed for descending thoracic aortic rupture. Her postoperative course, however, was atypical with a readmission 1 week after discharge with symptoms similar to her primary presentation. Alternative pathologies were then considered in a more elective setting in which the correct diagnosis of diffuse malignant mesothelioma was ultimately discovered in a patient with no previous exposure to occupational toxins. The tumour burden was advanced and the patient opted for palliative care. Herein, we suggest a consideration for oncological thoracic pathology in patients presenting with signs and symptoms mimicking acute thoracic aortic rupture or dissection, who may demonstrate atypical symptoms.

Keywords: Malignant mesothelioma • Aortic dissection • Aortic rupture

INTRODUCTION

Diffuse malignant mesothelioma originates from oncological conversion of mesothelial or submesothelial cells of the pleura, pericardium or peritoneum. More than 80% of mesothelioma cases originate in the pleura, and >80% of pleural cases occur in men [1]. Occupational exposure to asbestos has been determined to be causative in >90% of mesotheliomas [1, 2]. Surgery can be effective for localized cases; however, as the onset is usually insidious, most patients present with advanced tumour burden where palliation becomes the management course. Prognosis is poor with a <50% 6-month survival despite adjunctive treatment with chemotherapy or radiotherapy [3]. Herein, we describe the case of a woman who presented with acute onset of interscapular pain, haemodynamic instability and radiographic imaging suggestive of acute descending thoracic aortic rupture in which the diagnosis of advanced malignant mesothelioma was ultimately made.

CASE DESCRIPTION

An 82-year old Caucasian female with a cardiovascular history notable for hypertension, hyperlipidaemia and atrioventricular nodal re-entry tachycardia, status post-radiofrequency ablation and implantation of an internal cardiac loop recorder for recurrent dizziness and palpitations presented to the emergency department with recurrent left-sided chest discomfort, interscapular pain, abdominal fullness and bloating, without precipitating or aggravating factors. She had chronic chest discomfort over the past several months associated with unintentional weight loss and intermittent dysphagia, but her symptoms had worsened acutely in the few hours prior to presentation. She also experienced nausea, diaphoresis and dyspnoea on exertion. She was a lifelong non-smoker with minimal alcohol consumption and she had no previous exposure to occupational toxins.

Clinical examination revealed a thin elderly female who was afebrile, mentating well, but hypotensive. Laboratory parameters were within normal limits except for a haemoglobin of 9 g/dl. Her peripheral vascular examination was normal. Urgent echocardiography was unremarkable with mild atrioventricular valve regurgitation and normal systolic function; a previous pharmacological stress myocardial perfusion scan did not demonstrate acute or remote cardiac injury. Cardiac pacer interrogation revealed several long pauses with wide-complex tachycardia. A computed tomography (CT) scan was performed, which demonstrated a 14.6 cm intermediate density collection adjacent to the descending thoracic aorta, beginning distal to the left subclavian artery and extending to the level of the diaphragm (Fig. 1). Post-contrast imaging showed an increase in the density of the periaortic collection, suggesting contrast extravasation.

In the setting of haemodynamic instability with clinical and radiographic findings concerning acute contained thoracic aortic rupture, the patient underwent an emergent thoracic endovascular aneurysm repair (TEVAR) with a Gore thoracic aortic graft (TAG) thoracic endoprosthesis (W.L. Gore, Flagstaff, AZ, USA) with an additional distal extension. Postinterventional angiography failed to demonstrate an endoleak or contrast extravasation with excellent proximal and distal apposition. Her postoperative course was

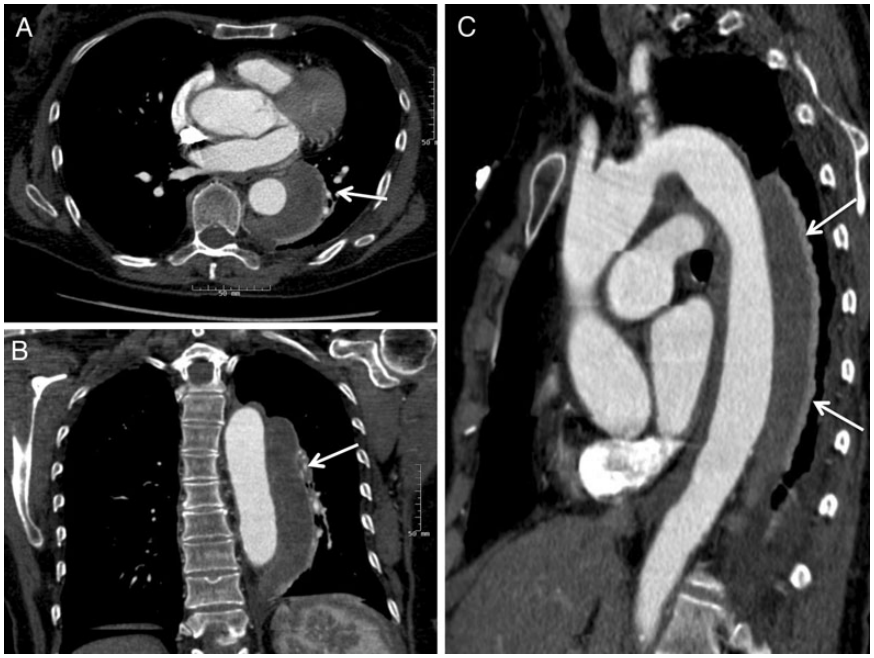

Figure 1: CT angiography of the descending thoracic aorta in axial (**A**), coronal (**B**) and sagittal (**C**) section demonstrating a periaortic fluid collection with contrast enhancement along the border (white arrows).

remarkable for continued nausea; she met discharge criteria on postoperative day 5. Of note, her chest pain and discomfort had completely resolved.

The patient presented 1 week later with recurrent chest discomfort and fullness with symptoms that were identical to her primary presentation. A repeat CT scan demonstrated good position of the endograft with no change in the periaortic collection with well-circumscribed and defined edges. Other alternative pathologies were considered and a thoracic surgery consultation was requested. A positron emission tomography-CT (PET/CT) scan was obtained to evaluate for malignancy.

The PET/CT demonstrated significant periaortic hypermetabolic uptake with areas of central radiolucency (Fig. 2A and B). There were multiple additional pleural nodules with hypermetabolic

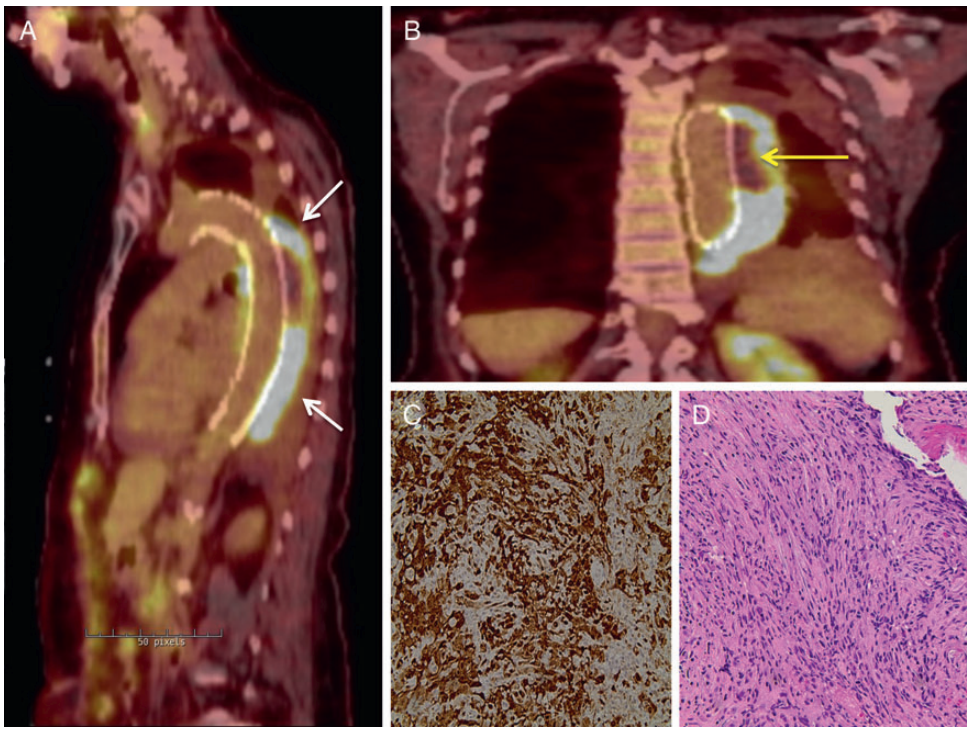

Figure 2: PET/CT scan in sagittal plane with significant hypermetabolic activity noted in the periaortic collection noted by white arrows (**A**). In the coronal plane, central radiolucency is shown (yellow arrow) corresponding to probable central necrosis. Histopathology confirmed malignant mesothelioma biphasic type with calretinin binding epithelioid cells (**C**) and spindled areas (**D**).

activity noted. The patient underwent a left video-assisted thoracoscopic surgery, and on entering the pleural cavity, several areas of pleural studding were noted, as well as a densely adherent periaortic mass. Multiple biopsies were obtained and a small left pleural effusion was also evacuated. No haematoma was identified. Histopathology was consistent with diffuse metastatic mesothelioma, biphasic type (Fig. 2C and D). The treatment options were discussed and the patient requested no further therapy; she is currently receiving hospice care.

DISCUSSION

Malignant mesothelioma is primarily a disease of adult life, with a peak incidence in the fifth to seventh decades [2]. The overwhelming majority are pleural mesotheliomas with a preponderance in men. Presenting symptoms are very non-specific and include chest pain, dyspnoea or both [3]. When chest pain does occur, it is usually dull in character [2]. Other symptoms include dysphagia, malaise, lethargy, anorexia and systemic metastatic symptoms. Physical examination is often equally unremarkable. Radiological imaging in the form of chest X-ray, CT scan, magnetic resonance imaging (MRI) and PET scan are helpful, but only a tissue sample can make a definitive diagnosis.

Malignant mesothelioma is classified into epithelioid, sarcomatoid or biphasic subtype based on tissue biopsy. Epithelioid is the most common subtype and responds the best to multimodal treatment. Sarcomatoid is the most aggressive subtype and patients mostly receive chemotherapy as radiotherapy is usually ineffective. The biphasic subtype, however, as in our patient, has the poorest prognosis, where palliative care often is the best, and the only treatment available; most cases of biphasic mesothelioma are fatal within 6 months. Although CT-guided tissue sampling is utilized, the highest yields are obtained either via open or via thoracoscopic pleural biopsy. Furthermore, as the onset is often quite insidious, patients usually present with advanced disease that generally precludes surgery as an effective option.

In the elective or outpatient setting, patients with such non-specific symptoms are usually comprehensively evaluated for other more common pathologies. Furthermore, an elderly female with vascular risk factors and no previous occupational exposure to asbestos makes the diagnosis of malignant mesothelioma less likely as an initial consideration. A detailed history along with physical examination and radiological imaging is imperative in maximizing the yield for an accurate diagnosis.

Differentiating aortic pathology from malignant mesothelioma is best made with imaging. Computed tomography angiography will demonstrate aortic wall integrity, whereas MRI possesses optimal soft tissue resolution for pleural and mediastinal disease. Retrospective review of the preoperative CT scan did demonstrate several subcentimetre pleural nodules that were too small to characterize but were noted to be hypermetabolic on subsequent PET/CT. Although PET/CT did demonstrate hypermetabolic activity suggestive of a malignant process, this modality is not readily available and not practical in an acute setting with haemodynamic compromise as was present in our patient.

Although rare, complications of malignant pleural mesotheliomas have mimicked acute thoracic vascular pathology [4, 5]. Retrospectively, the acute onset of chest pain in our patient was attributed to intratumour haemorrhage and the increased density of the periaortic fluid collection signified peritumour bleeding; this acute change resulted in hypotension. In addition, resolution of the pain following TEVAR was attributed to lagging effects of general anaesthesia, postoperative analgesia and cessation of the intratumour haemorrhage rather than the intervention itself. A history of vascular disease, however, along with haemodynamic instability and imaging which suggested contrast extravasation around the thoracic aorta necessitated urgent intervention. Once the postoperative course became atypical with a recurrent admission, re-evaluation was necessary to entertain other more unusual pathologies, ultimately resulting in the correct diagnosis of diffuse malignant mesothelioma.

Conflicts of interest: none declared.

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