CASE REPORT

An incidental finding of a calcified right-atrial mass in a young patient treated with chemotherapy 20 years ago

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Accepted 23 April 2014

SUMMARY

We describe a case of a young woman presenting with lethargy and pleuritic chest pain. She had a medical history of leukaemia treated successfully 20 years ago with chemotherapy via a long line. Although initial investigations suggested a diagnosis of pulmonary embolism (PE; on CT pulmonary angiogram (CTPA)) and a possible thrombus in the right atrium, her symptoms appeared out of proportion in relation to this diagnosis. Further imaging using transthoracic echocardiography suggested the presence of a calcified mass in the right atrium. She underwent successful surgical resection of the mass which was found to be attached to the lateral wall of the right atrium. She made an uneventful recovery and continued on warfarin therapy for 6 months in view of the diagnosis of PE on CTPA. We believe the calcified mass was probably caused by the presence of a long line at the time of her chemotherapy.

BACKGROUND

Masses in the heart can be due to a variety of causes. Although primary tumours of the heart are rare, early diagnosis and appropriate management can be vital in reducing morbidity and mortality. Before the development and significant improvement in echocardiography technology, intracardiac tumours were mainly diagnosed at postmortem. In addition, with the use of transoesophageal echocardiography, there has been a remarkable improvement in the diagnostic accuracy of these masses.

The symptoms and information from echocardiography usually differentiate these masses. This case illustrates a young woman who presented with unusual symptoms that resulted in a missed diagnosis. However, with the use of transthoracic echocardiography, she was treated rapidly and appropriately.

CASE PRESENTATION

A 26-year-old Asian woman presented with a 2-month history of lethargy and general malaise. In addition, she described intermittent left-sided sharp chest pain for 2 weeks which was pleuritic in nature and worse on exertion. Her symptoms of fatigue were gradually becoming worse causing her to become essentially bed-bound. In addition, she suffered from acute lymphocytic leukaemia 20 years ago which was successfully treated with chemotherapy via a long line (Hickman line). She denied any shortness of breath, palpitations, oedema, presyncope or syncopal episodes. She did

not have headaches, paraesthesia or focal neurological symptoms.

She was a non-smoker and had no other cardiovascular risk factors. Physical examination was unremarkable, including a normal heart rate (82 bpm), blood pressure (121/77 mm Hg) and her saturations were 98% on air with a normal respiratory rate. She was afebrile. Her cardiovascular, respiratory and detailed neurological examinations were all normal.

Her baseline full blood count, renal function, liver function, thyroid function tests and electrolytes as well as C reactive protein/erythrocyte sedimentation rate were normal. Her ECG was normal sinus rhythm and her chest radiograph was unremarkable.

In view of her symptoms of pleuritic chest pain, she had a CT of the pulmonary angiogram (CTPA) which demonstrated small left-sided pulmonary embolism (PE) and an abnormality in the right atrium (RA) possibly consistent with a thrombus (figure 1). She then had an urgent transthoracic echocardiogram (TTE) to investigate this abnormality in the RA. The TTE suggested there was a homogenous, bright echogenic mass within the RA and appeared to be attached to the lateral wall of the RA. The mass did not appear to extend to the interatrial septum (figure 2 and videos 1A and B). In view of the small left-sided PE, the most likely diagnosis was felt to be a thrombus in the RA. Anticoagulation was instigated with subcutaneous enoxaparin with a view to converting to oral anticoagulation for a period of 6 months.

One month later she was reviewed in the cardiology clinic. She reported worsening intermittent left-sided chest pain and lethargy. She then had another urgent TTE, which suggested that the mass had not changed in size compared to the previous TTE (despite 1 month of anticoagulation).

Figure 1 CT scan with a mass in the right atrium (arrow) demonstrated by the filling defect of the contrast suggesting abnormality of some sort in the right atrium.

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To cite: Rathod KS, Westwood M, Uppal R, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-203564

Figure 2 (A) Standard four-chamber transthoracic view showing the right atrium (RA), right ventricle (RV), left atrium (LA) and left ventricle (LV). There is an echogenic mass attached to the lateral wall of the RA (demonstrated by the blue arrow). (B) Close-up of the RA in the four-chamber transthoracic view demonstrating the mass attached to the lateral wall. RV, right ventricle.

Furthermore, a repeat CTPA was performed and on this occasion, the radiologist felt that the mass was probably consistent with calcification rather than a typical thrombus.

The cause of her symptoms was not completely clear but in view of this finding and after discussion at an urgent multidisciplinary meeting (including cardiothoracic surgeons and cardiologists), she was admitted and underwent urgent cardiothoracic surgery to resect this RA mass. Surgery was carried out under cardiopulmonary bypass. A hard calcified mass was found attached to the lateral wall of the RA (figure 3). The mass was excised in its entirety. The patient made an uneventful recovery

and continued on warfarin therapy for 6 months in view of the diagnosis of PE on CTPA. Histopathology results confirmed a calcified mass mixed with small amounts of thrombus.

INVESTIGATIONS

CT scan was carried out which with a mass in the RA demonstrated by the filling defect of the contrast suggested an abnormality of some sort in the RA. Initially this was felt to be a thrombus in the RA but a repeat CT scan performed after one pain suggested the mass was probably consistent with calcification rather than a typical thrombus.

TTE demonstrated an echogenic mass attached to the lateral wall of the RA (demonstrated by the blue arrow on figure 2).

DIFFERENTIAL DIAGNOSIS

Masses in cardiac chambers include myxomas, sarcomas, metastatic lesions and thrombus. Primary tumours of the heart are rare and are found in less than 0.02% of cases at postmortem.¹ Of these, 50% are myxomas.¹ Other causes of right atrial masses include vegetation and secondary thrombi which could potentially extend from the vena cava into the RA.

OUTCOME AND FOLLOW-UP

The patient was reviewed again at 6 months since her surgery and has made a complete recovery with no recurrence of any symptoms and hence discharged from the clinic.

DISCUSSION

Our case demonstrates successful excision of a calcified mass in the RA.

Foreign bodies retained in the heart could lead to a number of complications including tricuspid valve insufficiency, thrombus formation, cardioembolic stroke, arrhythmias and infections.²

Interestingly, patients may remain asymptomatic for some time before constitutional signs and symptoms begin to appear as in our case.² Choi *et al*² described a case where they found a plastic cannula protruding out of the RA months after an invasive procedure.

Although there are no formal guidelines, Actis Dato *et al*³ assessed 14 cases of foreign bodies in the heart and suggested some guidelines about the management of these foreign bodies. They suggested that if the patient is symptomatic then surgical removal should be carried out, if the patient is asymptomatic (with associated risk of infection, embolisation, erosion) then surgery is indicated and if the patient is asymptomatic without any symptoms then surgery is indicated depending on the location and nature of the foreign body within the heart.³

Video 1 (A) Standard four chamber transthoracic view showing the right atrium, right ventricle, left atrium and left ventricle. There is an echogenic mass attached to the lateral wall of the RA. (B) Close-up of the RA in the four chamber transthoracic view demonstrating the mass attached to the lateral wall.

Figure 3 (A) (Surgeon's view) The tip of the blue arrow points to a mass protruding outward from the right atrium (which is open). The mass (which was attached to the lateral wall) was calcified and believed to be attached to an iatrogenic piece of a plastic line which once was part of intravenous central access. (B) Pair of forceps aligned against the resected mass.

Echocardiography is often the first line of investigation in patients believed to have intracardiac pathology (as in our case). However, there are times that echocardiography alone is not capable of characterising myocardial tissue, particularly when the mass appears bright and homogenous. Cardiac magnetic resonance (CMR) provides detailed information about the size and location of masses. In addition, CMR can assess T1-weighted and T2-weighted characteristics of the mass, and has the ability to use fat-suppression techniques as well as provide histopathological characteristics of a mass.⁴

However, in our case, since the mass remained the same in size despite 1 month of anticoagulation and our patient developed significantly worsening symptoms, we did not wait for a CMR. Our patient was referred for urgent inpatient cardiothoracic surgery to resect the mass, which confirmed the presence of calcification, most likely due to the presence of a previous long line 20 years ago.

Contributors KSR and AD were responsible for coordinating the contribution of all authors to this paper. All authors made significant contributions to the development and conceptualisation of the manuscript. KSR and AD were responsible for drafting this paper. MW and RU were responsible for editing and guidance on the paper. All authors were responsible for critically revising the paper. All authors approved the final version of this paper for submission.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

Learning points

- ▶ Masses in the right atrium can present with a number of non-specific symptoms.
- ▶ Long lines can lead to complications after a number of years after their removal and therefore have immediate and long-term risk of complications.
- ▶ Masses in the right atrium should generally be removed as they can result in a number of complications including tricuspid valve insufficiency, thrombus formation, cardioembolic stroke, arrhythmias and infections.

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