

## Intracardiac thrombus mimicking invasive sarcoma on CT

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**Section:** Cardiovascular

**Area of Interest:** Cardiac Cardiovascular system

**Procedure:** Contrast agent-intravenous

**Procedure:** Diagnostic procedure

**Procedure:** Comparative studies

**Imaging Technique:** CT-Angiography

**Imaging Technique:** CT

**Imaging Technique:** MR

**Special Focus:** Embolism / Thrombosis Neoplasia

Case Type: Clinical Cases

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Sakthithasan, Thomas Chance

**Patient:** 79 years, female

### Clinical History:

A 79-year-old female patient presented with 6 weeks of increasing breathlessness. On clinical examination her chest was clear and a chest radiograph demonstrated cardiomegaly. A CT pulmonary angiogram was performed to rule out pulmonary thromboembolism.

### Imaging Findings:

A CT pulmonary angiogram showed a large, infiltrating septal mass involving both atria, the tricuspid valve and extending into the right ventricle. It was encasing the superior vena cava and appeared to protrude into the left atrium with suspected involvement of the pericardium. Bilateral pleural effusions and significant reflux of contrast into the inferior vena cava and hepatic veins was noted. This mass had features of an infiltrating tumour, such as sarcoma. A staging CT abdomen pelvis scan was performed which did not show any additional findings. This mass had attenuation of approximately 90 HU on a contrast study. The patient was referred to a tertiary centre for cardiac MRI which demonstrated similar findings. An endovascular biopsy was done which showed organising thrombus and no evidence of neoplasm. Anticoagulation therapy was started, and after 5 months the follow-up MRI revealed almost complete resolution, confirming that it had been a thrombus.

### Discussion:

Cardiac thrombus is an important finding for clinical management since they have a risk of embolising and associated detrimental effects. There are various causes and predisposing factors of thrombi in different chambers of the heart. CT is more sensitive for detecting ventricular and atrial thrombi than transthoracic echocardiography, but it is inferior to transoesophageal echocardiography for evaluating atrial thrombi. Cardiac MRI is the best for tissue characterisation and helps to distinguish thrombi from tumours. Cardiac thrombi are much more common than

cardiac tumours. Cardiac tumours are rare and the commonest primary cardiac neoplasm is myxoma, which is a benign tumour. Sarcoma is the most common primary malignant tumour [1]. Thrombus usually has a smooth margin and, though avascular, some thrombi may show delayed contrast enhancement, suggesting organising thrombus [2]. An organising thrombus can mimic a cardiac tumour [3] like myxoma, but a cardiac thrombus mimicking an invasive sarcoma is very unlikely. Characteristics favouring sarcoma are; a broad based lesion, absence of a pedicle and an aggressive pattern (such as involvement of the vena cava, interatrial septum or pericardium) [4]. Unlike benign tumours, sarcomas tend to involve multiple chambers and involve valves by direct extension [4]. Our patient had most of these features of a sarcoma. Thrombus formation is more common in the left atrium than the right. The most common cause of right heart thrombus is embolisation from a peripheral venous source [2]. In a patient with right heart thrombus, Behcet's disease should also be ruled out [2]. There are various other causes of right heart thrombi, however, the exact cause of such an extensive thrombus mimicking an invasive tumour was not clear in our case. One of the proposed differential diagnoses was of a small interatrial septal myxoma with superadded large thrombus, which resolved on anticoagulation therapy. Cardiac thrombi are managed with anticoagulation therapy and follow-up.

Written informed patient consent for publication has been obtained.

**Differential Diagnosis List:** Intracardiac organising thrombus, Cardiac rhabdomyosarcoma, Small myxoma with superadded large thrombus

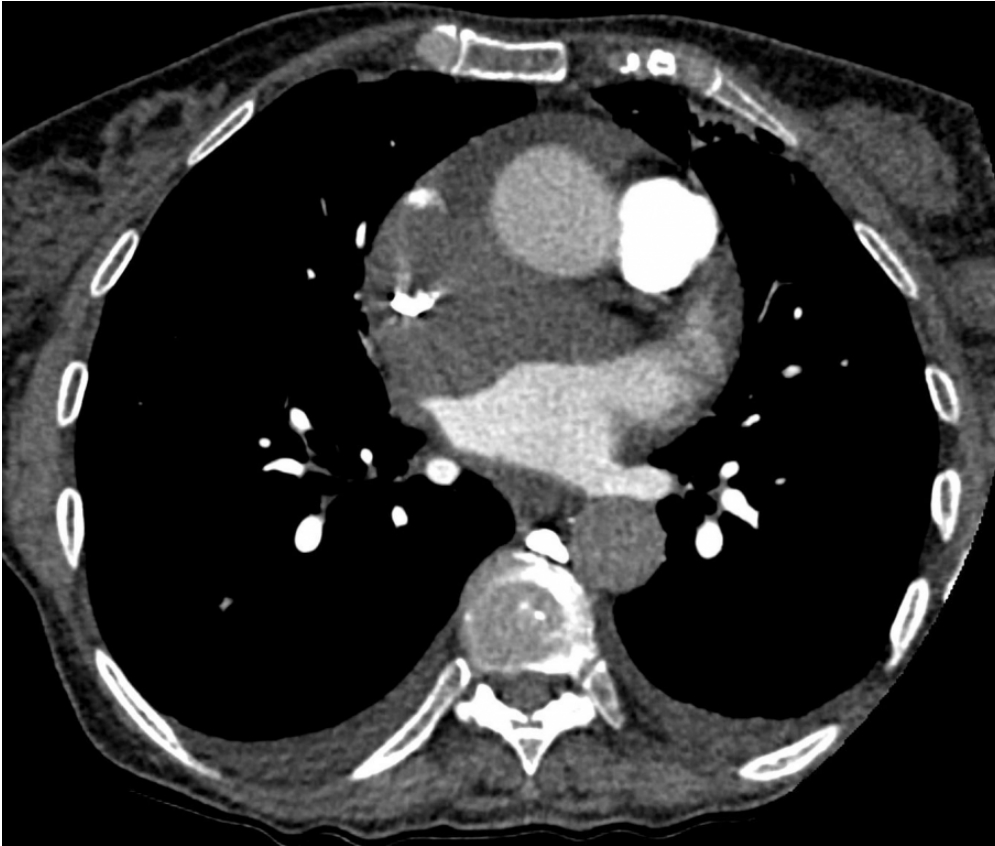
**Final Diagnosis:** Intracardiac organising thrombus

#### References:

- Tatli S, Lipton MJ (2005) CT for intracardiac thrombi and tumors. *Int J Cardiovasc Imaging* 21(1):115-31 (PMID: [15915945](#))
- Sibel T, Ozgur UO, Cetin E (2013) Imaging of intracardiac thrombus. *Cor et Vasa* 55(2):e176-e183
- Ji SL, Wan SK, Seong MK, Je KS (2016) Organizing thrombus mimicking a cardiac tumor located at the mitral-aortic intervalvular fibrosa. *Korean J Thorac Cardiovasc Surg* 49(1):42-45 (PMID: [26889446](#))
- Ganesh S (2006) Primary cardiac sarcoma. *Euro J Cardio-Thorac Surg* 29(6):925-932

**Figure 1**

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**Description:** CT pulmonary angiogram showing a cardiac mass encasing and narrowing the SVC.

**Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 2**

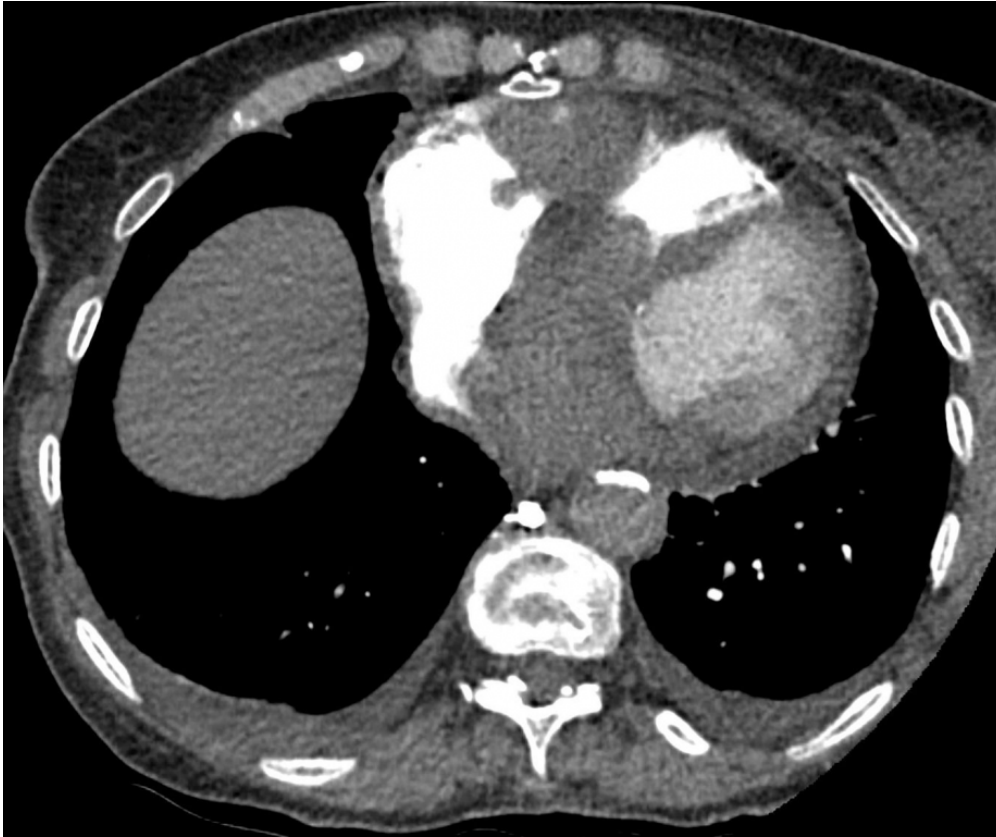
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**Description:** CT pulmonary angiogram showing a cardiac mass arising from the interatrial septum with extension into both the right and left atria. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 3**

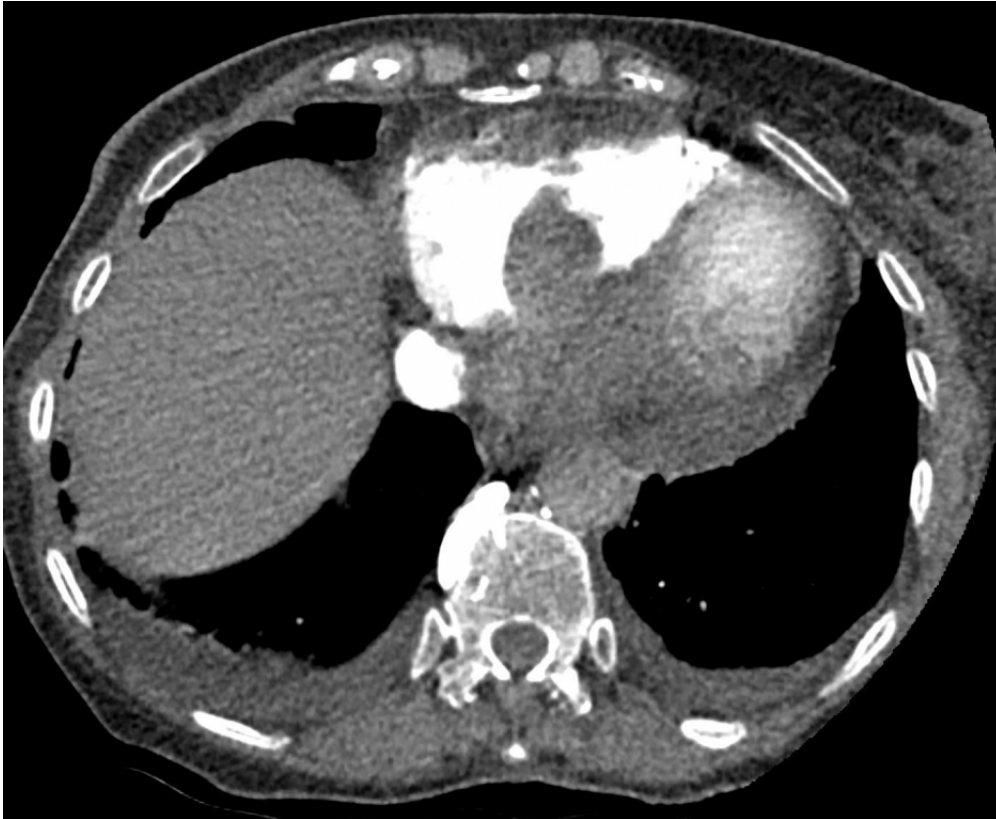
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**Description:** CT pulmonary angiogram shows the cardiac mass involving the tricuspid valve. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 4**

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**Description:** CT pulmonary angiogram shows the cardiac mass extending into the right ventricular inflow tract. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 5**

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**Description:** CT pulmonary angiogram - coronal reconstruction showing an interatrial mass with extension into the atria and right ventricle with SVC encasement. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 6**

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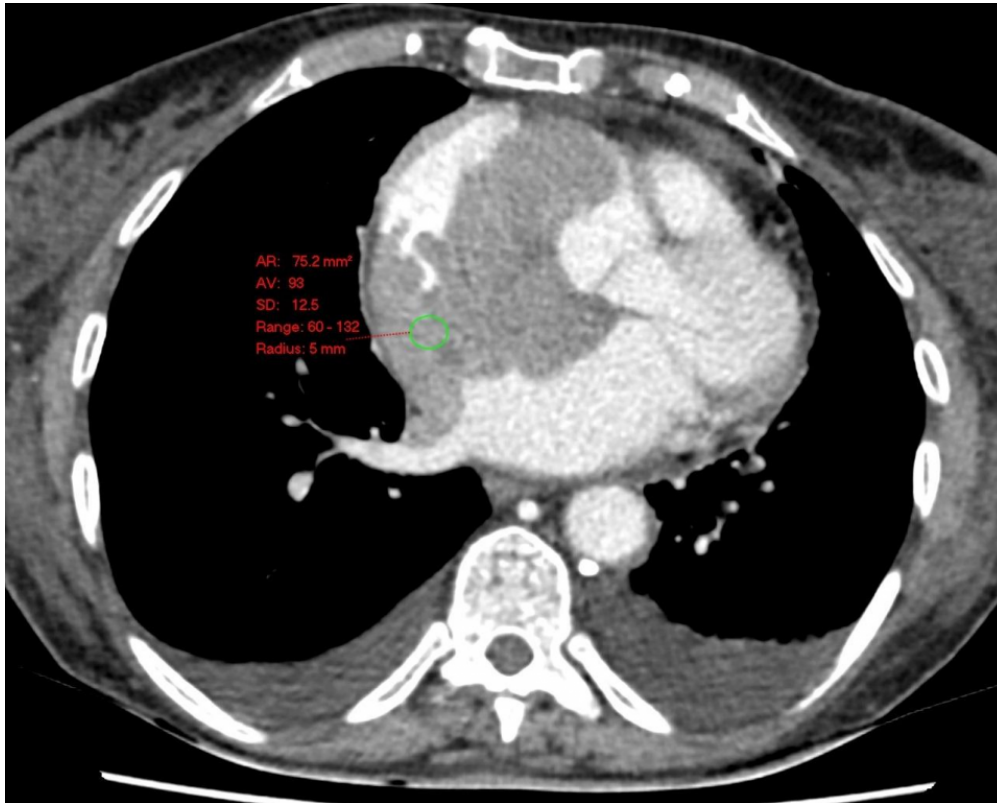


**Description:** CT pulmonary angiogram - sagittal reconstruction MIP image showing the mass. Significant reflux of contrast seen in the IVC suggesting right heart strain. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK



**Figure 7**

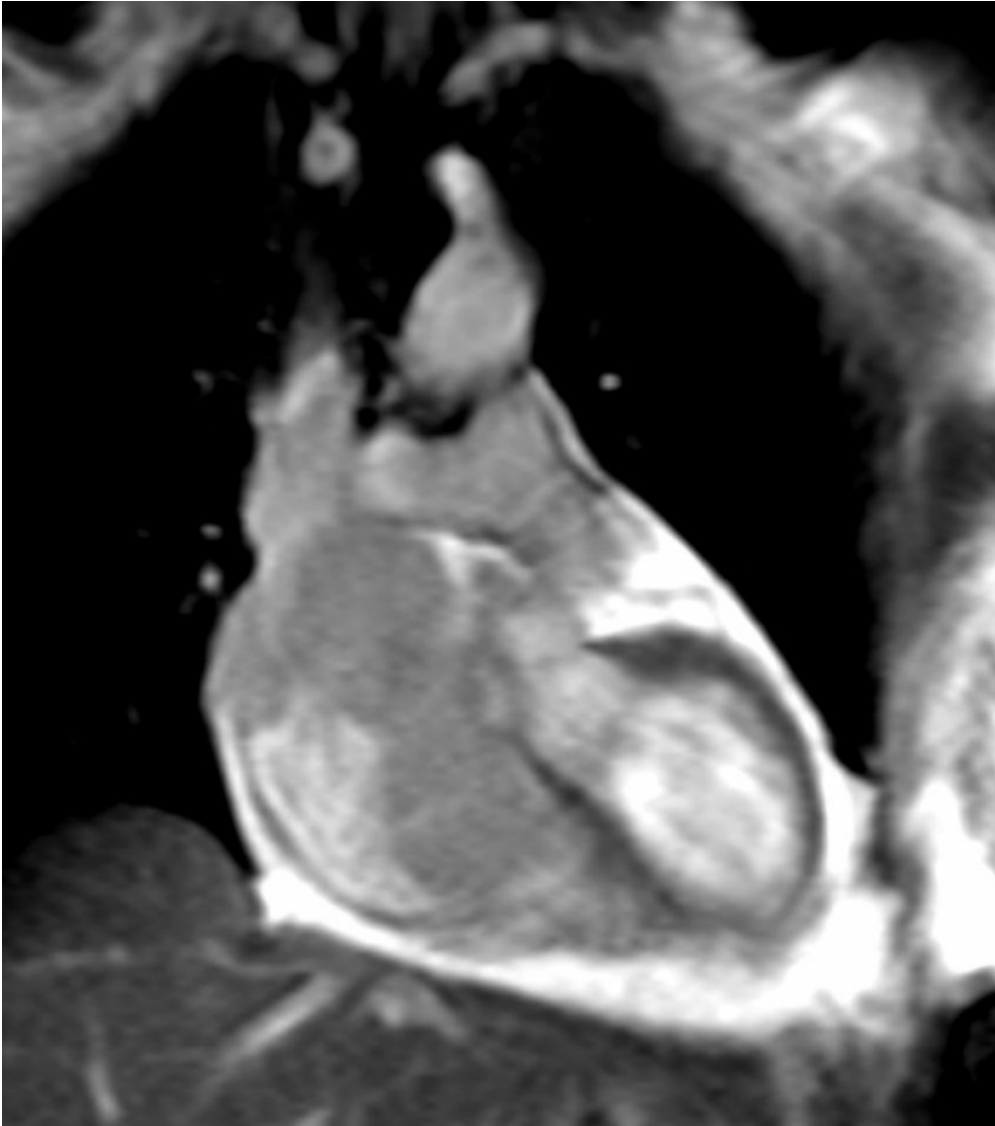
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**Description:** CT with delayed contrast - the cardiac mass demonstrates an attenuation value of 93 HU, with a heterogeneous appearance. **Origin:** Department of Radiology, Yeovil District Hospital NHS Foundation Trust, Yeovil, UK

**Figure 8**

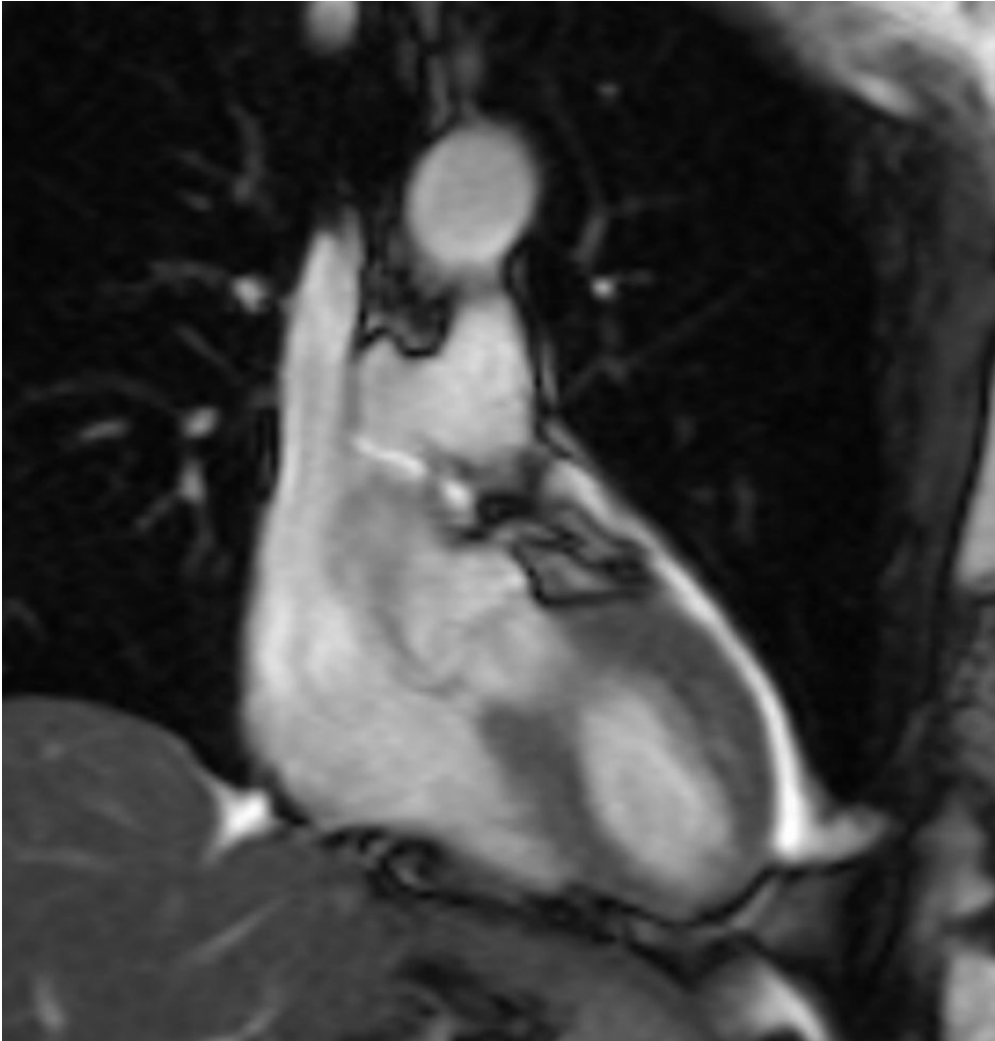
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**Description:** Coronal pre-treatment MRI showing a large mass predominantly in the right atrium, extending into the right ventricle. **Origin:** Bristol Heart Institute, University Hospitals Bristol NHS Foundation Trust

**Figure 9**

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**Description:** Follow-up MRI, 5 months after starting anticoagulation treatment shows resolution of the mass. **Origin:** Bristol Heart Institute, University Hospitals Bristol NHS Foundation Trust