CASE REPORT

Silent broken heart (Can shortness of breath be the only presentation of myocardial infarction?)

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SUMMARY

A 55-year-old previously healthy man was referred to our cardiology outpatient department (by the respiratory team) due to shortness of breath that started 2–3 months prior. He suddenly became breathless after changing a car wheel with no other associated symptoms. Specifically, he denied ever having had chest pain. His breathlessness got gradually worse preventing him from performing simple everyday activities, such as climbing stairs, and a couple of weeks before presentation, the patient noticed ankle oedema. He was an ex-smoker and drank 3–4 units of alcohol daily. There was a family history of hypertension. He worked as a contract manager in the construction industry. After clinical examination, a transthoracic echocardiogram was performed and the patient was admitted for further investigations. Clinical examination and investigation confirmed missed myocardial infarction with a complication of ventricular aneurysm. The patient was referred to cardiothoracic surgeons for surgical correction of the defect.

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Clinical examination showed regular pulse at 140 bpm at rest, blood pressure of 148/106 mm Hg, respiratory rate of 26 breaths/min with oxygen saturation of 96% on room air. The patient weighed 67.15 kg and had a body mass index of 24.2 kg/m². On auscultation of precordium, he had an extremely loud, harsh pansystolic murmur, loudest at the left sternal edge, associated with a trill. There was also a third heart sound. His ECG at presentation showed inferior and lateral ST and T wave changes but no prominent Q waves.

INVESTIGATIONS

A transthoracic echocardiogram was performed in the clinic, which showed a small hyperdynamic left ventricle, with good left ventricular (LV) ejection fraction, but at the base of the heart there was a large pseudoaneurysm that communicated with the right ventricle through a large ventricular septal defect (VSD) ([figure 1](#)).

Cardiac CT scan showed inferior ventricular pseudoaneurysm and a VSD of the inferior septum ([video 1](#)).

Right and left cardiac catheterisation showed blocked right coronary artery with tight ostial left main stenosis of more than 50% and an inferior basal LV aneurysm ([figure 2](#)) that had ruptured into the right ventricle, resulting in a massive

CASE PRESENTATION

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TTE Image 1

TTE image 2

Figure 1 Transthoracic echocardiogram showing a large aneurysm/pseudoaneurysm communicating with the right ventricle through a large ventricular septal defect.

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Video 1 Cardiac CT showing inferior ventricular aneurysm/pseudoaneurysm and a ventricular septal defect of the inferior septum.

left-to-right shunt. Right heart catheterisation confirmed the left-to-right shunt as shown by high right ventricular pressure along with other parameters as in [table 1](#). Calculated cardiac output was 4.3 L/min and cardiac index 2.4 L/min/m²; Q_P:Q_S 4:1.

The patient was referred to the cardiothoracic team for surgical correction of the defect.

TREATMENT

The patient was referred to the cardiothoracic surgeons and underwent repair of the post-infarct VSD. After median sternotomy and establishment of the cardiopulmonary bypass with bicaval cannulation, and return to the ascending aorta, the LV was opened through the aneurysmal portion. The large VSD from mid septum to apex posteriorly was repaired using infarct

Figure 2 Left ventriculogram showing inferior basal left ventricular aneurysm/pseudoaneurysm.

Table 1 Right heart catheterisation parameters

Chamber	Pressure	Saturations
SVC	Mean 20	64.9
RA	Mean 20	66.2
IVC	Mean 20	76.1
RV	104 (EDP 23)	96.9
PA	104/37 (mean 68)	90.1
LV	136 (EDP 28)	96.8
Ao	142/92 (112)	97.3

Ao, aorta; EDP, end diastolic pressure; IVC, inferior vena cava; LV, left ventricle; PA, pulmonary artery; RA, right atrium; RV, right ventricle; SVC, superior vena cava.

occlusion with pericardial patch and 3/0 prolene with teflon buttress.

OUTCOME AND FOLLOW-UP

The patient was followed up postsurgery. He remained well after surgery with no symptoms of concern and a good activity level. Echocardiogram was repeated at 1 month postsurgery, which showed no evidence of residual flow across the septum. The LV was not dilated with LV end diastolic diameter of 5 cm and LV end systolic diameter of 3.7 cm.

DISCUSSION

LV pseudoaneurysm can develop following ventricular rupture due to transmural myocardial infarction (MI).¹ The incidence of LV free-wall rupture in patient with acute MI treated with primary percutaneous coronary interventions has been reported in the literature to be 2%.² The differential diagnosis between an aneurysm and a pseudoaneurysm is not always easy and is based on clinical information (time after MI) and morphological characteristics (diameter of the neck compared to maximum diameter of the cavity and wall composition of the cavity). In our case, there are features favouring both diagnoses. Specifically, the cavity has a relatively narrow neck, in keeping with the diagnosis of pseudoaneurysm, but at the same time, on CT, the cavity wall appears not be composed only of pericardium and is more suggestive of a true aneurysm. The final diagnosis will be made on the operating table. This case is unique in terms of coexistence of the pseudoaneurysm with a ventricular septal rupture, which is another very rare complication of MI associated with a very high mortality,^{3 4} and by the fact that the patient appeared to tolerate both complications relatively well. Interestingly, there was no previous cardiac history or chest pain preceding presentation. Subsequent investigations and cardiac catheterisation showed an ischaemic aetiology.

Learning points

- Imaging skills aid in the diagnosis of atypical presentations and prompt further management of these fatal conditions.
- Left ventricular pseudoaneurysm and ventricular rupture, even in the absence of previous cardiac history and chest pain, might be ischaemic in origin.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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