Left ventricular pseudo-false aneurysm perforating into the right ventricle

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Abstract

Left ventricular pseudo-false aneurysms are a very rare complication of myocardial infarction. Occasionally, they will perforate into the right ventricle. Their haemodynamic presentation is similar to postinfarction ventricular septal defect. Even with no early clinical symptoms, they can lead to congestive heart failure or sudden fatal rupture. We report on a 67-year old man who developed a large left ventricular pseudo-false aneurysm that perforated into the right ventricle late after acute inferior myocardial infarction. He had undergone percutaneous coronary intervention to the right coronary artery in August 2013. During the surgery performed in July 2014, with only incision at the aneurysm, the small perforation to the right ventricle was closed directly and the large perforation to the left ventricle was closed with a bovine pericardial patch. Considering the late mechanical complications attendant to left ventricular remodelling, physicians should conduct careful long-term follow-up of patients with transmural myocardial infarction, even if previous percutaneous coronary intervention was successfully performed.

Keywords: Pseudo-false aneurysm • Left ventricle • Right ventricle • Myocardial infarction

INTRODUCTION

Left ventricular (LV) pseudo-false aneurysms are sporadically reported as rare complications of myocardial infarction (MI). Occasionally, an LV pseudo-false aneurysm perforates into the right ventricle (RV). Here, we report on a 67-year old man with an LV pseudo-false aneurysm perforated into the RV late after successful percutaneous coronary intervention (PCI) for acute inferior MI.

CASE REPORT

A 67-year old man, who had undergone PCI to the right coronary artery for acute inferior MI in August 2013, was referred to our hospital due to an LV aneurysm communicating to the RV. Although he had only slight dyspnoea on exertion, cardiac catheterization showed a large LV aneurysm perforating into the RV. The LV ejection fraction (EF) was 39%; pulmonary artery pressure was 45 mmHg; pulmonary/systemic flow ratio was 2.2. The previous PCI, in which some drug-eluting stents were inserted into the proximal right coronary artery, remained effective. Contrast-enhanced computed tomography (CT) showed a 45 × 75 mm aneurysm on the postero-inferior wall (Fig. 1A and B). Transoesophageal echocardiography revealed a large defect between the LV and the aneurysm and an abnormal flow from the aneurysm to the RV (Fig. 1C). Surgical repair was recommended because of expected haemodynamic deterioration and potential fatal rupture of the aneurysm.

During the surgery performed in July 2014, the aneurysm, which was not adhered to the pericardium, was found to be located on the postero-inferior wall. When it was opened longitudinally on the left side of the right posterior descending coronary artery, two orifices were detected: a large one 25 × 65 mm in diameter communicating to the LV (Fig. 2A) and the small one 7 × 10 mm in diameter communicating to the RV. The mitral valve annulus and subvalvular apparatus were intact. The small orifice was closed directly with three pledged mattress stitches (Fig. 2B), whereas the large one was closed with a bovine pericardial patch secured to the interventricular septum and the free wall of the LV with interrupted pledged mattress stitches (Fig. 2C). The incision at the aneurysm was closed with running sutures, using Teflon felt strips in order not to injure the right posterior descending coronary artery. The cross-clamp times and cardiopulmonary bypass times were 139 and 189 min, respectively. The length of ICU stay was 2 days. Postoperative transthoracic echocardiography revealed an improvement in LV function (LVEF: 59%), and contrast-enhanced CT revealed no leakage of blood into the aneurysm. The patient was discharged on postoperative day 21.
DISCUSSION

An LV pseudo-false aneurysm, which was first reported by Stewart et al. [1], is a very uncommon complication of MI. It occurs when haemorrhagic dissection into the area of a transmural MI does not completely reach the epicardium and is contained within the area of the infarcted myocardium. Although no pathological examination was performed, based on operative findings of no adhesion between the epicardium and the pericardium [2], the present patient was diagnosed as having an LV pseudo-false aneurysm perforating into the RV.

Fukuda et al. [3] and Tasaki et al. [4] described the perforation of an LV pseudo-false aneurysm into the RV following acute inferior MI. Although the haemodynamics of this condition are similar to those of postinfarction ventricular septal defect, congestive heart failure does not occur immediately because the perforation usually develops in the subacute or chronic phase of MI. However, persistent left-to-right shunts gradually worsen pulmonary vasculature and LV function. Additionally, LV pseudo-false aneurysms have a higher possibility of rupture compared with LV true aneurysms [4], and there have been some reports of their actual rupture [5]. Therefore, prompt surgical repair for LV pseudo-false aneurysms is recommended.

Without the incision at intact LV myocardium, only making an incision directly into the aneurysm enables closure of both orifices communicating with the RV and LV. The orifice communicating with the RV is so small that it can be closed directly, whereas the orifice communicating with the LV is relatively large, so that it should be closed with a patch so as not to distort the mitral subvalvular apparatus. The size of patch should be smaller than the actual size of the orifice as its size is determined after the purse string suturing performed in the Dor procedure. This allows the physician to predict the expected shape of the LV. The aneurysm should be opened on the left side of the right posterior descending coronary artery, which makes it easy to apply the patch to the orifice through the LV and keeps the right posterior descending coronary artery intact.

Considering late mechanical complications attendant to LV remodelling, careful long-term follow-up is mandatory after...
transmural MI. In particular, following an inferior MI, an LV pseudo-false aneurysm is a rare but possible complication that should be watched out for. Reportedly, the interval between the initial MI and the development of an LV pseudo-false aneurysm can vary from a few weeks to a few years, unlike the development of a postinfarction ventricular septal defect. Sometimes, the detection of an LV pseudo-false aneurysm is delayed because of no clear clinical symptoms. When managing patients with heart failure late after MI, physicians should naturally pay close attention to the progression of coronary arterial lesions, but should also be watchful for the development of mechanical complications including true aneurysms, pseudoaneurysms and shunt complications.

**Conflict of interest:** none declared.

**REFERENCES**


