

Hemodynamically Stable Left Ventricular Pseudoaneurysm: Who Should Manage - Surgeon or Cardiologist?

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ABSTRACT

The left ventricular (LV) pseudoaneurysms are very rare but dreaded complication resulting mostly after myocardial infarction. Many times they pose diagnostic and therapeutic dilemma. Management guidelines are not well defined although majority of the cases are treated surgically. We present the case of a 65-year-old male with post-infarction LV pseudoaneurysm, hemodynamically stable, yet managed surgically considering the occurrence of future complications. Management protocol should be individualized based on the clinical scenario. Although surgery is considered the best management strategy, close medical follow-up may be considered in selected patients.

Key words: Asymptomatic, pseudoaneurysm, rupture

INTRODUCTION

The left ventricular (LV) pseudoaneurysms are rare, but dreaded complication of acute myocardial infarction amounting to 0.1% of myocardial infarctions.^[1] After an acute coronary artery occlusion, the ventricular wall undergoes ischemic necrosis^[2] and rupture, leading to hemodynamic collapse and death of the patient, sometimes even before seeking medical attention. The LV pseudoaneurysms can also clinically present as pericardial tamponade, shock, massive thromboembolism, or life-threatening arrhythmias. Very rarely even after myocardial rupture, the pericardium and fibrous tissue hold the blood resulting in the formation of a pseudoaneurysm which may remain asymptomatic and present later. Although pseudoaneurysms can remain silent initially, they can rupture later causing mortality. They can thrombose, get infected, exert pressure effect on surrounding structures or be a focus for arrhythmia in the long term. Hence, early surgical intervention used to be the dictum,

whenever an LV pseudoaneurysm was diagnosed in earlier clinical practice. However, there are reports establishing stability of the pseudoaneurysm over years, thus shifting the paradigm toward medical management in selected patients.

CASE REPORT

A 65-year-old hypertensive male presented to our unit with 1-day history of breathlessness and chest discomfort. He gave a history of inferoposterolateral wall myocardial infarction 6 months back. Coronary angiogram revealed significant triple vessel disease which was then managed with deployment of everolimus-eluting stent in the occluded major obtuse marginal branch (culprit vessel). His echocardiogram revealed hypokinesia of inferoposterolateral wall and fair LV systolic function. Post-procedure, he was stable and on optimal medical management had a symptom-free period of 6 months. During the present admission, he was anxious but stable

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hemodynamically. Neither his electrocardiogram nor the cardiac enzymes showed any evidence of an acute coronary event. His echocardiogram showed regional wall motion abnormality of the posterolateral wall with a 2.5 cm well-defined defect in the midposterolateral segment with a large pseudoaneurysm and mild LV dysfunction. He was on statin, ticagrelor (antiplatelet), and beta-blocker therapy. Since he had a coronary angiography performed 6 months earlier, further angiogram was not performed.

Considering the risk of pseudoaneurysm rupture, he was taken up for surgical repair, even though stable clinically. Peroperatively, there was a 7 cm × 5 cm pseudoaneurysm with fibrous covering in the LV posterolateral wall with normal contraction of rest of the myocardium [Figure 1]. Under standard cardiopulmonary bypass and root cold blood cardioplegic myocardial arrest, the pseudoaneurysm was opened and mouth of the aneurysm was identified [Figure 2]. The edges were thick and well defined. The defect was closed with a 0.6 mm thick prosthetic patch [Figure 3] and the aneurysm wall was excised, the edges of which were approximated with hard Teflon felt. He underwent coronary artery bypass grafting (CABG) to the left anterior descending, posterior descending, and obtuse marginal arteries. Postoperatively, he had diffuse bleeding due to the antiplatelet for which he had mediastinal exploration twice. Otherwise, he had a stable post-operative period and was discharged after 10 days.

DISCUSSION

The LV aneurysms can be true or false. Both result from myocardial infarction, but pseudoaneurysms have also been reported after blunt trauma surgery,^[3,4] coronary spasm,^[5] infective endocarditis^[6] or inflammation.^[2] Although there are many differentiating features [Table 1], clinical distinction between true and pseudoaneurysm can be sometimes really challenging.^[7] Transthoracic echocardiogram can usually identify the aneurysm, but transesophageal echocardiography, computed tomography scan, or cardiac magnetic resonance imaging may be required as additional modalities when in dilemma.^[8] Our patient presented late in a relatively stable condition. Due to the large size considering the possibility of rupture of pseudoaneurysm as estimated to be 30–45%,^[9] we considered it ideal to be managed surgically.

Many cardiologist advise medical follow-up of these patients, especially when clinically stable and small. Due to the emergence and easy availability of advanced cardiac imaging, asymptomatic LV pseudoaneurysms are being increasingly reported compared to the past. A retrospective review of 52 patients with pseudoaneurysm by Yeo *et al.*^[10] could not find rupture episodes in 10 medically managed subjects during follow-up. Ludmir *et al.*^[11] reported a

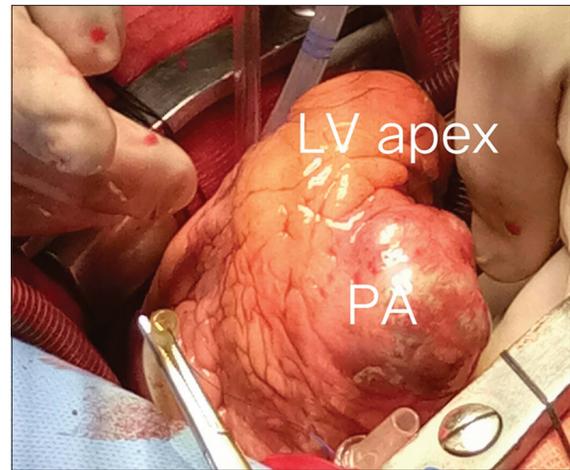


Figure 1: The left ventricular pseudoaneurysm in posteroinferior wall



Figure 2: Opened pseudoaneurysm with arrow pointing the mouth

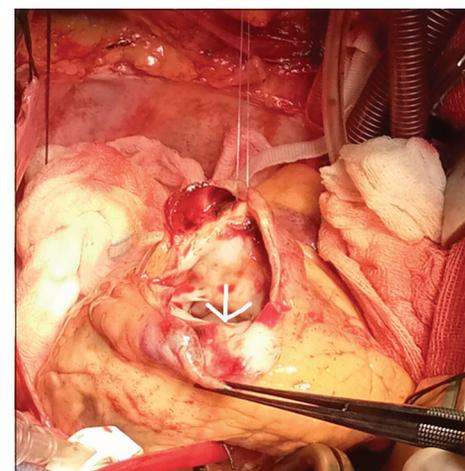


Figure 3: After repair with a prosthetic patch (P)

case of 68-year-old male with multiple comorbidities who presented with post-infarction LV pseudoaneurysm who was followed up with medical management for 6 months

Table 1: Differentiating features of true and false left ventricular aneurysms

Characteristics	True aneurysm	Pseudoaneurysm
Etiology	CAD	CAD mostly, other causes also
Location	Anterior wall, apex	Posterolateral wall
Chance of rupture	Low	High
Wall	Thinned out myocardium	Pericardium, fibrous tissue
Neck	Wide	Narrow
Neck to cavity diameter ratio	0.9–1	0.25–0.5
Management	Medical/surgical	Surgical mostly
Ventricular function	Significant dysfunction	Rest of myocardium usually normal

CAD: Coronary artery disease

who remained clinically stable during follow-up. A similar case was reported by Mao *et al.*^[12] where an 82-year-old with post-infarction LV pseudoaneurysm was managed with CABG and medical follow-up for the aneurysm which remained stable even after 10 years. There are other advocates of medical management also who prefer to follow-up these patients with optimal medicines and avoidance of strenuous physical activities. The benefit of avoiding a surgery in these stable patients should be weighed against sudden unexpected event of a rupture, hemodynamically significant arrhythmia, or a massive thromboembolism.^[13]

In the clinical update by Hulthen *et al.*,^[14] they clearly establish the role for clinical decision-making by discussing the management of pseudoaneurysms in different clinical scenarios. The final management should be guided by the timing of pseudoaneurysm formation, location, size, and associated complications (arrhythmias and thromboembolism) in asymptomatic patients. As per the available literature, those pseudoaneurysms which are reasonably acute (<3 months of onset), atypical location (lateral or anterior), large size (definite cutoff not known), and associated complications (arrhythmia, thrombosis, and infection) should be managed surgically for a better outcome. Anticoagulation without excision of a thrombosed pseudoaneurysm can aggravate hemorrhagic complications, especially in elderly. Chronic small pseudoaneurysms in elderly, especially detected incidentally, may be followed up medically. This particularly holds good for those who are poor surgical candidates.

CONCLUSION

The LV pseudoaneurysms are rare complications which often pose diagnostic and therapeutic dilemma. Management protocol should be individualized based on the clinical scenario. Even though surgical repair is preferred by most

considering the late occurrence of complications, medical follow-up may be adopted in selected patients.

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