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CASE REPORT

Left ventricular pseudoaneurysm: a case report and discussion on differential diagnoses

Kong Bing TAN *MBBS (S'pore),* *Siang Hui LAI *MBBS (S'pore)* and *Keng Poh WEE *FRCPA, DMJ (Clin. et Path)*

*Department of Pathology, National University of Singapore and *Centre for Forensic Medicine, Health Sciences Authority, Republic of Singapore.*

Abstract

Left ventricular pseudoaneurysm is a rare complication of myocardial infarction or cardiac trauma. We report a case of sudden death from rupture of such a lesion. Clinically, these lesions need to be distinguished from the other ventricular out-pouching lesions (true aneurysms and diverticula) because of their greater likelihood for rupture. Pathologically, apart from often being infarct-related, they are characterized by a narrow connection with the ventricular cavity and a fibrous outer wall that is devoid of myocardial tissue.

Keywords: haemopericardium, ventricular aneurysm, false aneurysm, ventricular diverticulum, sudden death, myocardial infarction, cardiac rupture.

INTRODUCTION

Pseudoaneurysm or false aneurysm formation of the left ventricle is a rare complication of myocardial infarction or cardiac trauma.[1,2] It deserves recognition because of its higher propensity for rupture as compared to the more commonly occurring true aneurysm.[2,3] We present a case of fatal rupture of a left ventricular pseudoaneurysm and discuss the clinicopathological differentiation of this entity from the other known ventricular out-pouching lesions, namely (true) ventricular aneurysms and ventricular diverticula.

CASE REPORT

A 50-year-old Chinese gentleman, with a history of non-insulin dependent diabetes mellitus, collapsed while having lunch. He was brought to the Emergency Department with no spontaneous pulse or respiration. Electrocardiographic tracing showed pulseless electrical activity. Resuscitative efforts were futile. A coronial autopsy was performed. He had no known history of other coronary risk factors such as hypertension, hyperlipidaemia and smoking.

At autopsy, there was 100 ml of blood and clots in the pericardial sac. A thin-walled out-pouching lesion, measuring 2.5 cm in greatest dimension, was located on the left free wall of the heart (Fig. 1). A tiny defect on the surface was noted. This out-pouching lesion was bounded by only a thin fibrous layer externally, and comprised a cystic space within the myocardial wall that communicated with the main ventricular cavity through a narrow 0.2 cm diameter opening (Fig. 2). On either side of the cystic space where there was myocardium, a region of transmural myocardial fibrosis, occupying a total area of approximately 4 cm^2 of the lateral wall of the left ventricle, was noted. All three major coronary arteries and their branches showed moderate to severe atherosclerotic stenosis. The lungs were congested. The other organs were morphologically normal.

Microscopical examination of the out-pocketing lesion revealed a fibrous wall without endocardium or myocardium (Fig. 3). An adherent microscopic thrombus was present within the lesion. The gross and microscopical features were those of a left ventricular pseudoaneurysm, consistent with having arisen at the site of a previous myocardial infarction.

DISCUSSION

The clinical features of left ventricular pseudoaneurysms are non-specific.[4] A recent review disclosed that congestive heart failure,

Address for correspondence and reprint requests: *Dr Tan Kong Bing, Department of Pathology, National University of Singapore, National University Hospital, Lower Kent Ridge Road, Singapore 119074. Email: pattankb@nus.edu.sg*

FIG. 1: External view of the left lateral surface of the heart, demonstrating the pseudoaneurysm (arrowhead).

FIG. 2: Transverse section through the heart, showing the pseudoaneurysm in the left lateral ventricular wall, with the instrument demonstrating the communication between the pseudoaneurysm and the left ventricular cavity.

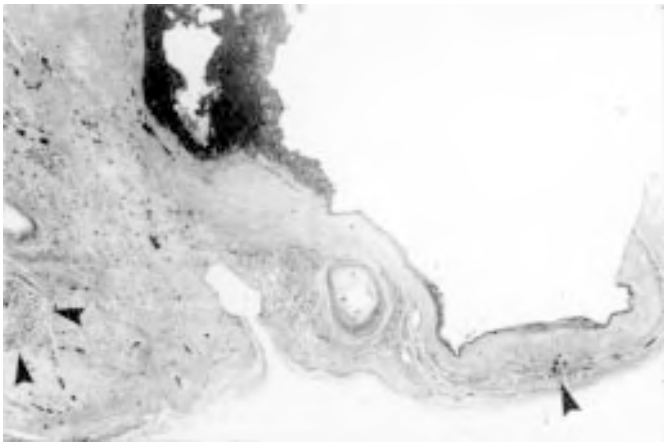

FIG. 3: The wall of the pseudoaneurysm is composed of fibrous tissue and is devoid of myocardial fibres (arrowhead). Note the presence of myocardial bundles in the adjacent myocardium (double arrowhead). (Masson-Trichrome, x 20)

chest pain and dyspnoea were the most frequent presenting symptoms.[4] Our patient presented with sudden death, a very uncommon mode of presentation (3%). It is likely that diabetic autonomic neuropathy with associated silent myocardial ischaemia, contributed to our patient's apparently negative cardiac history.

The timely recognition of left ventricular pseudoaneurysms with the use of cardiac imaging is important.[2] Early surgical treatment is often indicated as they have in excess of a 30% risk of high fatality rupture if left untreated.[4] In contrast, true ventricular aneurysms are generally managed more conservatively.[2,4]

Clinically, both true aneurysms and pseudoaneurysms typically arise as complications of myocardial infarction, while ventricular diverticula are usually congenital in nature.[5] Rare examples of ventricular diverticula have nevertheless been reported in ischaemic "stunned" myocardium in the context of ischaemic heart disease.[6]

Pathologically, both pseudoaneurysms and diverticula are characterized by a narrow connection with the ventricular cavity while true aneurysms have a broad connection to the main ventricular cavity.[2,6] Pseudoaneurysms are thought to form when myocardial rupture is contained by epicardium, adherent pericardium or fibrous tissue.[1,2,4] Histology discloses that the pseudoaneurysm's thin fibrous wall is devoid of myocardial tissue.[1-3] In contrast, the wall of ventricular diverticula is composed of all three layers: endocardium, myocardium and epicardium.[5,7] The wall of the true ventricular aneurysm features an inner lining of endocardium and some myocardial elements, on a background of fibroconnective tissue.[1-2] The more considerable myocardial component in the diverticulum wall as compared to the aneurysm wall helps explain why during systole, the former characteristically shows variable contraction while the latter tends to be poorly kinetic or even show paradoxical expansion.[6,8]

In summary, left ventricular pseudoaneurysm is a rare complication of scarring from previous myocardial infarction. Clinically, it is a diagnostically challenging entity that needs to be recognized because of its potential for catastrophic rupture. With pathological examination, ventricular aneurysms and pseudoaneurysms, both of which are generally acquired, can be distinguished from the mostly congenital ventricular diverticula. This differentiation may be pertinent in the medico-legal context, specifically with regards to the consideration of life insurance issues.

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