CASE REPORT

Systolic Compression of the Left Coronary Artery Caused by a Postinfarction Left Ventricular Aneurysm

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ABSTRACT

A 65-year-old man who developed a ventricular aneurysm following myocardial infarction is presented here with the special finding of systolic compression of the left anterior decending coronary artery by the true aneurysm. In addition to clinical and angiographic findings of the case, we also discuss the causes of myocardial ischemia in ventricular aneurysm and the meanings of systolic compression of coronary arteries. (***Tzu Chi Med J*** 2002; **14**:329-332)

Key words: ventricular aneurysm, coronary artery compression, myocardial infarction, myocardial ischemia

INTRODUCTION

Left ventricular (LV) aneurysm is a common complication following myocardial infarction and is not seldom associated with postinfarction myocardial ischemia [1]. We present a case in which postinfarction LV aneurysm may have caused myocardial ischemia via a novel mechanism of coronary artery compression in the absence of atherosclerotic stenosis.

CASE REPORT

A 65-year-old man was admitted to our hospital because of crescendo angina. Cardiac catheterization showed he had triple vessel coronary artery disease with normal global and regional LV systolic function. He underwent percutanous transluminal coronary angioplasty (PTCA) and all coronary lesions were successfully dilated with normal coronary flow restored (Fig. 1). Thereafter, the patient was well except that one episode of severe chest tightness was ever experienced for four hours about one month after PTCA. He didn't try sublingual Nitroglycerol (NTG) at that time. He paid little attention to it because chest discomfort subsided. He returned to the clinic two months later. In the cardiology clinic, the electrocardiogram revealed a typical infarction pattern with pathological Q waves, ST segment elevation and inverted T waves in the all precordial leads. Echocardiography disclosed a huge apical aneurysm and impaired global LV function. Because recurrent and frequent rest angina ensued in a day, he was readmitted and received cardiac catheterization immediately four months after PTCA. Left ventriculography demonstrated a large anteroapical aneurysm and impaired global left ventricular performance. Coronary angiography showed near-total occlusion of the middle portion of the left anterior descending artery (LAD) with faint distal flow (Fig. 2). PTCA was repeated and successfully opened the LAD lesion. However, the mid- and distal-LAD was found to be displaced anterolaterally and the arterial lumen seemed pulsatilely compressed during systole (Fig. 3), a phenomenon that had not been demonstrated in the previous angiographic study

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(Fig. 1). The patient was free of angina symptoms after the secondary angioplasty but, unexpectedly, died during sleep at home three days later.

DISCUSSION

Systolic compression of the coronary artery is commonly found in cases of myocardial bridging and septal perforator compression, but rarely in cases of pericardial fibrosis, tumor, foreign body [2], or pseudoaneurysm [3,4]. Angelini et al presented the first case of systolic compression of a collated stenotic right coronary artery by ventricular aneurysm [5]. The clinical importance of systolic compression of the coronary artery is controversial. Physiologically, coronary arteries are thought to be perfused mainly during diastole. However, several authors have reported angina, myocardial infarction and even sudden death in patients with myocardial bridging [2] and surgical correction has resulted in relief of angina and ischemia in some patients [6]. Recently, using intracoronary ultrasound and doppler, Ge et al demonstrated a characteristic flow pattern of the bridged coronary artery, in which delayed compression release of the coronary artery and reduced coronary flow reserve

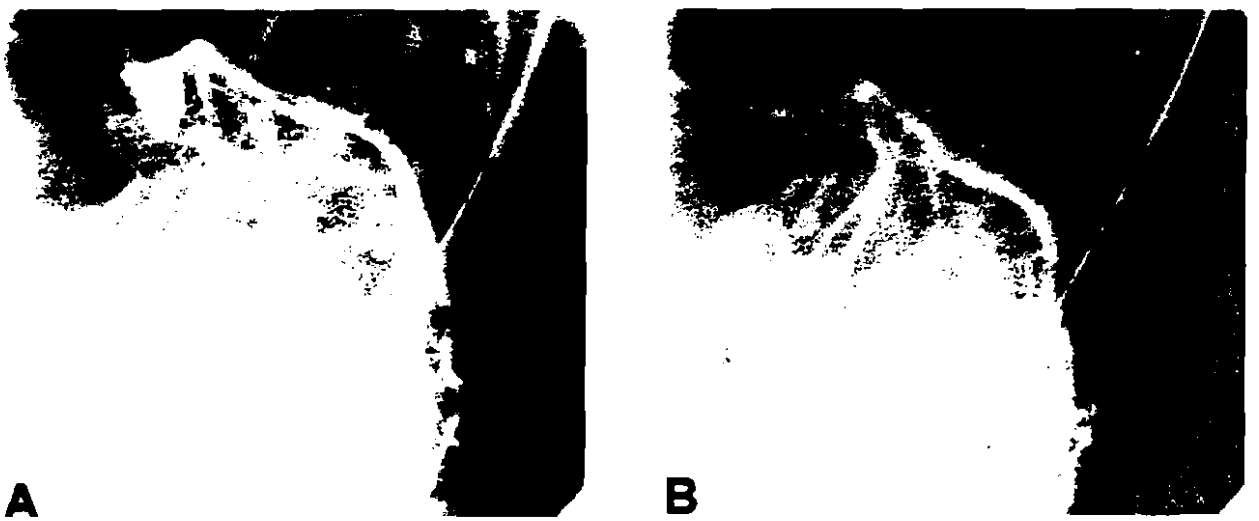

Fig. 1. Coronary angiogram after angioplasty in the left anterior oblique projection shows no significant stenosis in the left anterior descending coronary artery during diastole (A) as well as during systole (B).

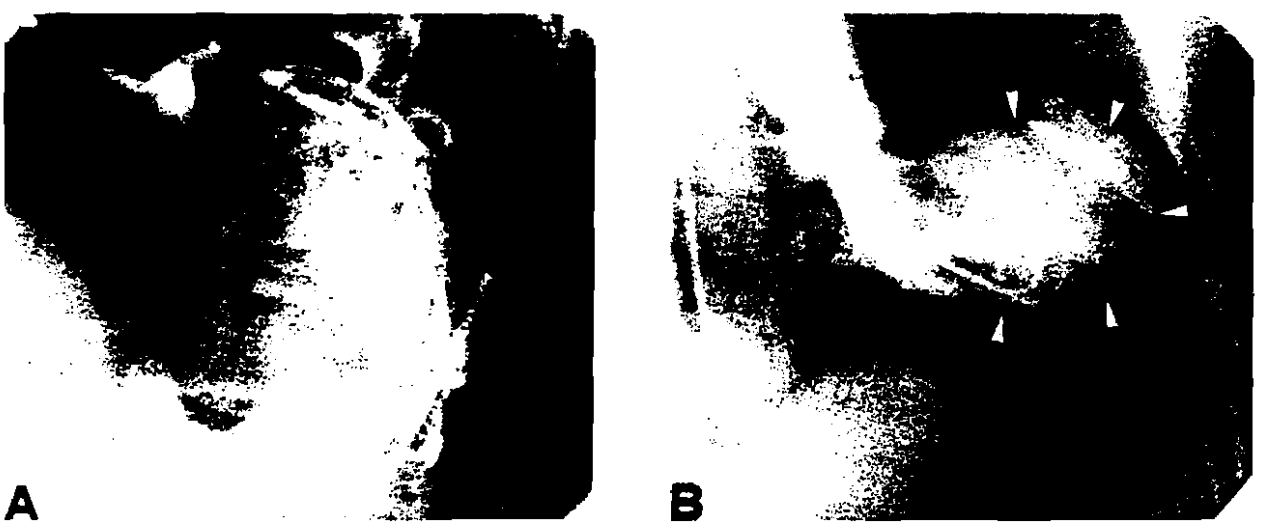

Fig. 2. Coronary angiogram (A) and left ventriculogram (B) show near-total occlusion of the mid-left anterior descending coronary artery and a large anteroapical aneurysm (arrowheads), respectively, 4 months after angioplasty.

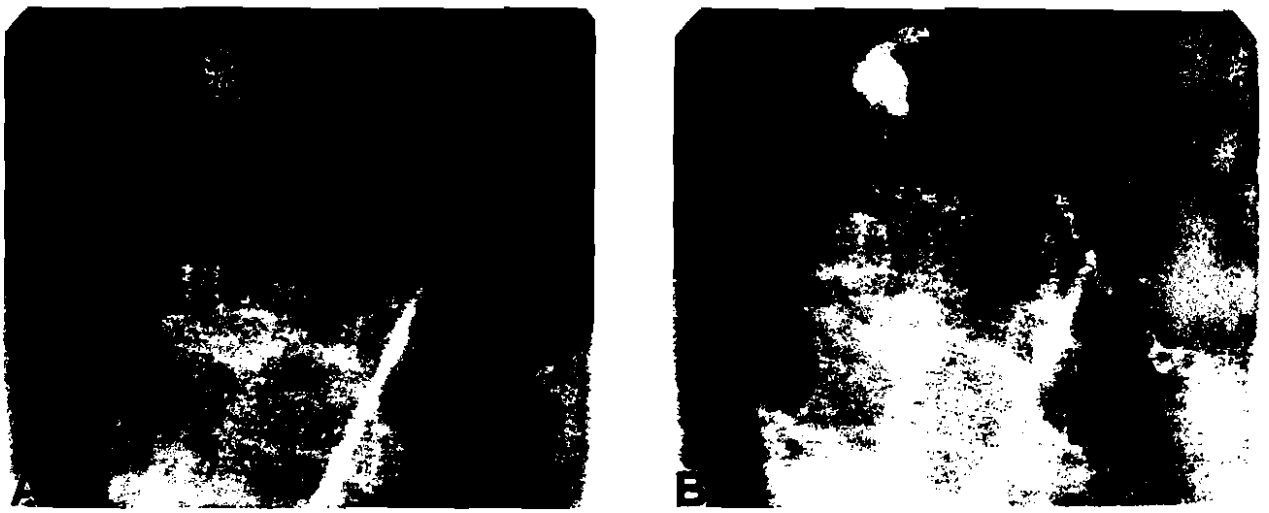

Fig. 3. Coronary angiogram after the second angioplasty. The left anterior descending coronary artery is displaced anterolaterally and the arterial lumen is normal during diastole (A), but severely compressed by the ventricular aneurysm during systole (B).

may possibly explain signs of ischemia [7]. Thus, these data support the concept that external systolic compression of coronary arteries may cause significant myocardial ischemia.

The present case is an unusual example of systolic compression of the LAD by a postinfarction LV aneurysm. In the literature, about half of patients with LV aneurysm suffer angina and may benefit from aneurysmectomy [1]. Conventionally, myocardial ischemia in association with LV aneurysm is considered to be caused by increased wall tension and concomitant coronary atherosclerosis [1]. The coronary angiographic findings in this case, however, imply that external compression of the coronary by the postinfarction LV aneurysm may be another important mechanism of myocardial ischemia and even sudden death. Unfortunately, we didn't perform a thallium scan in time to support this hypothesis.

We conclude that external compression of coronary arteries by a LV aneurysm may cause myocardial ischemia even in the absence of coronary artery stenosis. The clinical evaluation of postinfarction LV aneurysm should include the possibility of coronary artery compression in angiographic study. Once angiographically documented, further tests for myocardial ischemia are warranted. Optimal therapy for this unusual condition, however, remains to be clarified.

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梗塞後左心室血瘤壓迫左冠狀動脈血流一病例報告

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摘要

一個65歲男性病人在心肌梗塞後，發生左心室血瘤，而他的左前降枝冠狀動脈因此受到心室血瘤之壓迫。我們不僅討論此病例臨床上與血管攝影之發現，並且探討心室血瘤對心肌缺氧之影響與冠狀動脈壓迫之意義。(慈濟醫學 2002; 14:329-332)

關鍵語：心室血瘤，冠狀動脈壓迫，心肌梗塞，心肌缺氧

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