CASE REPORT

Angina with a normal coronary angiogram caused by amyloidosis

D C Whitaker, M F Tungekar, J E Dussek

A case of severe intractable angina pectoris with normal angiography is described. Following video assisted thoracoscopic sympathectomy the patient died of heart failure. Microvascular cardiac amyloidosis was diagnosed at the postmortem examination. This report alerts clinicians to the possibility of this diagnosis when treating patients with severe angina when no cause is found and discusses the poor prognosis in such cases.

Early amyloidosis without myocardial involvement can produce severe anginal symptoms by obstructing the intramural (rather than the epicardial) coronary arteries. The prognosis for this condition is poor.1 In a case series, five of 153 (3%) patients with angina and a normal coronary angiogram had small vessel disease secondary to amyloidosis.2 Another unrelated series found up to 30% of patients with anginal symptoms to have a normal coronary angiogram.3 The overall frequency of such amyloid related angina is unknown. However, we suggest that amyloid be considered in cases of severe angina that is not otherwise explicable.

CASE REPORT

A 65 year old non-smoking male retired squash coach presented with exertional dyspnoea. An exercise ECG showed myocardial ischaemia. He also developed a widespread inflammatory arthritis treated with sulfasalazine and methotrexate. Coronary angiography showed good left ventricular function and mild atheroma at the origin of the left anterior descending coronary artery, which would not be expected to cause angina even at extreme exertion. The exertional angina persisted and one year later an exercise test was also positive with major ST changes after only four minutes of the Bruce protocol. Repeat angiography showed the minor stenosis in the artery of the left anterior descending coronary artery. There was no amyloid in the epicardial coronary arteries and the myocardium. There was no atheroma in the epicardial coronary arteries, conflicting with the angiogram report.

DISCUSSION

“Syndrome X” describes patients with angina of exertion, a positive exercise ECG, and a normal coronary angiogram, but excludes coronary artery spasm (Prinzmetal’s angina).4 It is a heterogeneous syndrome with several suggested mechanisms. “Microvascular angina” refers to all patients with ischemic symptoms. The epicardial coronary arteries are typically spared. Vascular involvement is more common in AL amyloidosis within the walls of the smaller coronary and pulmonary arteries (fig 1). There was no amyloid in the epicardial coronary arteries and the myocardium. There was no atheroma in the epicardial coronary arteries, conflicting with the angiogram report.

The most common form of amyloidosis is AL or primary amyloidosis. It results from the extracellular deposition of amyloid fibrillar protein by monoclonal plasma cells. Cardiac complications develop in most patients with amyloidosis and cause death in about 50%. Although congestive heart failure is the most common complication, obstructive intramural coronary artery amyloid deposition more rarely causes ischemic symptoms. The epicardial coronary arteries are typically spared. Vascular involvement is more common in AL amyloid than other types.5 Although there have been previous reports of ischemic syndromes with amyloidosis,6 we were unfamiliar with this association, and amyloid was not considered to be a possible antemortem diagnosis in the case described. An element of epicardial coronary spasm may have contributed to the ischemia but there was no radiological evidence for this when the patient was experiencing pain during his second angiogram. All patients with obstructive intramural coronary artery amyloid deposition seem to have impaired coronary flow reserve.7 8
VATS sympathectomy has recently been evaluated as a treatment for severe angina untreatable by other means. Its aim is to improve symptoms and reduce ischaemia but the clinical results do not show a convincing benefit.

It is particularly important to diagnose amyloid in such cases of angina because prognosis of patients with intra-coronary amyloid is reported to be extremely poor. In a case series of five, all patients developed congestive heart failure. In another series of 11 patients the mean time to death or transplantation after the onset of ischaemic symptoms was 18 months. Intervention to relieve symptoms is unlikely to alter this prognosis. In the case described in this report a diagnosis of amyloid could possibly have been made if a skin, rectal, lung, or myocardial biopsy had been taken. Knowing the diagnosis of amyloid would alert the attending clinicians to the poor prognosis, and interventional treatment such as VATS sympathectomy may be avoided. Chemotherapeutic regimens are available for treating primary amyloidosis and may be of more benefit. Cardiac transplantation may be another option.

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