Spontaneous coronary artery dissection of all major coronary arteries

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Spontaneous coronary artery dissection is a rare cause of myocardial infarction and sudden cardiac death. A 32-year-old man presented with effort angina. He had a positive treadmill exercise electrocardiogram test, and coronary angiography showed that he had dissection of all major coronary vessels. The left anterior descending coronary artery was completely blocked, probably secondary to dissection and subsequent occlusion. He was advised to undergo coronary artery bypass surgery, to which he did not agree; instead, he was treated by medication and followed up.

Key Words: Angina; Angiography; Coronary artery; Dissection

Spontaneous coronary artery dissection (SCAD) is a rare cause of myocardial infarction (MI) and sudden cardiac death (1,2). Women, especially in the postpartum period, appear to be more commonly affected than men (3,4). The most common mode of presentation is that of sudden onset myocardial ischemia in the absence of any previous history of heart disease.

The present paper reports a young man who presented with effort angina. Coronary angiography showed coronary dissection of all major coronary vessels.

CASE PRESENTATION

A 32-year-old male patient presented with angina, reportedly lasting for over two months. He was not a hypertensive, but he was a smoker and had dyslipidemia (elevated low-density lipoprotein cholesterol – 4.1 mmol/L). He did not have clinical features of Ehlers-Danlos syndrome. A treadmill exercise test was positive for induced ischemia at a low workload of 4.6 metabolic equivalents. An echocardiographic evaluation showed no regional wall motion abnormality and good left ventricular function. Coronary angiography revealed a normal left main coronary artery. The left anterior descending coronary artery (LAD) was completely blocked after the first diagonal branch and was partly collateralized. The first diagonal branch showed dissection in its proximal segment (Figure 1). The left circumflex coronary artery showed a short segment of dissection in its proximal part (Figure 2). The third major obtuse marginal also showed dissection. The posterior descending coronary artery also showed dissection; it arose from the left circumflex coronary artery, which was dominant (the right coronary artery was nondominant). The posterior descending coronary artery also showed dissection (Figure 1). He was advised to undergo coronary artery bypass

Dissection spontanée de toutes les grosses artères coronaires

La dissection spontanée des artères coronaires est une cause rare d'infarctus du myocarde et de mort subite. Voici le cas d'un homme de 32 ans qui a consulté pour des douleurs angineuses à l'effort. Une épreuve d'effort sur tapis roulant s'est révélée positive, et la coronarographie a montré une dissection de toutes les grosses artères coronaires. L'artère interventriculaire antérieure gauche était complètement obliterée, probablement à cause de la dissection et de l'obturation qui s'en est suivie. On a conseillé au patient de subir un pontage coronarien, mais il a refusé; il a donc été traité par des moyens médicaux et a fait l'objet de suivi.

Figure 1) Left coronary injection in left anterior oblique (60°) cranial (30°) view showing dissection of the first diagonal branch (one arrowhead), the third obtuse marginal branch (two arrowheads) and posterior descending coronary artery arising from the left circumflex coronary artery (three arrowheads). A completely blocked left descending coronary artery is also shown (arrow)

graft surgery (CABG) for revascularization, to which he did not agree, and he was therefore treated with medication and followed up.

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Figure 2) Left coronary injection in anteroposterior cranial (30°) view showing a completely occluded left anterior descending coronary artery at origin of the first diagonal branch. Dissection in the left circumflex coronary artery (arrow) and diagonal branch of the left anterior descending coronary artery is also seen (arrowheads)

DISCUSSION

SCAD is a rare cause of ischemic heart disease. In the majority of cases the diagnosis is made postmortem, but sometimes the diagnosis may be established angiographically during or after an episode of acute coronary syndrome (1-4).

Coronary dissection can be associated with atherosclerotic coronary artery disease, aortic root dissection or it may be a secondary injury produced by blunt chest trauma. Other reported associations include cystic medial necrosis and Ehlers-Danlos syndrome, and in some cases it is idiopathic. The pathology is that of an intramural hematoma that expands and produces an acute coronary syndrome; intimal tears are seldom observed.

Reports of SCAD simultaneously involving all three coronary arteries are exceptional and limited to very few case reports (5-11). The present case is unique for a number of reasons. The

patient presented with effort angina, which is very rare: the most common mode of presentation of SCAD is acute myocardial ischemia. Only one recently published report (12) describes a SCAD with an initial presentation of effort angina. Second, the patient had the involvement of all major coronary vessels. Furthermore, the LAD was completely blocked, which we assumed may be secondary to its dissection and subsequent occlusion. The occluded LAD may have been the reason for the patient's angina.

The treatment of acute MI subsequent to coronary dissection is controversial. Because thrombolysis can expand the intramural hematoma and extend the dissection, it can be catastrophic. However, there are reports (7) of successful treatments of SCAD patients with thrombolysis.

After the initial management of the acute condition, subsequent treatment options are also controversial. There are several reports (13) of CABG in patients with spontaneous coronary dissection, particularly in those with left main stem involvement or multivessel dissections. It is important to note that literature suggests that CABG in SCAD patients may be hazardous because of the chance of dissection progression through the venous and arterial conduits or into the distal part of the grafted vessels. Many reports recommend that this type of revascularization should be reserved for patients in whom aggressive medical treatment fails (1). Longheval et al (14) report a good prognosis following healing of dissections, so there is a scope for medical treatment.

Several recent studies have reported stent placement for the treatment of SCAD (1). The results were good, with reportedly low rates of restenosis; however, this treatment should be reserved for localized dissection.

The present case poses problems when the type of revascularization is considered. Because of the widespread nature of the dissection, both CABG and the positioning of coronary stents would be difficult. Treating the dissection by means of multiple stenting in the distal part of arteries less than 2 mm in diameter would be more difficult, so CABG was recommended, to which the patient did not agree. He has been on regular follow-up and antianginals, acetylsalicylic acid, clopidogrel and atorvastatin for the past one year without worsening symptoms. The present case was reported because of the patient's unique condition.

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