Two cases with spontaneous spasm of left main trunk

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SUMMARY Two cases with spontaneous spasm of the left main trunk are described. Collateral vessels were visualised during spasm in both cases, and disappeared after its relief by the administration of nitrites.

Coronary artery spasm may cause the various types of angina pectoris,1-3 and if it occurs spontaneously during coronary arteriography it may be mistaken for an organic stenosis.4-10 The distinction between spasm and fixed obstruction is important, especially when it is located in a critical site. We describe two cases with spontaneous spasm of the left main trunk associated with visualisation of collateral vessels which might easily have been confused with arteriosclerotic stenosis.

Case reports

CASE 1
A 36-year-old housewife was admitted to hospital with a two month history of an oppressive sensation in the precordium on exertion and at rest. Physical examination was normal.

The resting electrocardiogram showed inverted T waves in leads V1 to V4. ST segment depression in leads V2 to V6 occurred during precordial oppression at rest and just after double Master's test.

Cardiac catheterisation was performed using Sones's technique. When the catheter was advanced into the innominate artery, the patient complained of an oppressive sensation in the precordium and there was ST segment depression in leads V2 to V6. Coronary angiography at that time disclosed 90% narrowing of the left main trunk (Fig. 1a) and collateral vessels (Fig. 1b) to the left anterior descending artery from the right coronary artery through the interventricular septum. Angiography was repeated after spontaneous resolution of the symptoms and ST changes. Narrowing of the left main trunk had become less, and the collateral vessels were hardly seen.

Subsequently she exercised on a bicycle ergometer, pedalling at a workload of 35 W. After one minute of exercise the precordial discomfort and ST segment depression recurred. Coronary angiograms were obtained immediately and showed the same abnormalities as those occurring during the spontaneous attack. After sublingual administration of 0·6 mg glyceryl trinitrate and injection of 10 mg isosorbide dinitrate into the sinus of Valsalva, only 25% stenosis of the left main trunk (Fig. 1c) was present. The left anterior descending, left circumflex, and right coronary arteries were normal, and collateral vessels were no longer visible (Fig. 1d).

CASE 2
A 53-year-old man presented to hospital with anterior chest pain at rest during the day and on walking, especially in the early morning. This pain, relieved by sublingual administration of glyceryl trinitrate, appeared two and a half months before admission. Physical and laboratory examinations showed nothing abnormal. The resting electrocardiogram was normal. The double Master's test performed in the early morning was positive with ST segment depression in leads V4 and V5, and the same test in the afternoon was negative.

Coronary arteriography by Sones's technique was carried out. Chest pain occurred spontaneously, with ST segment depression from leads V3 to V6 just before the catheter was introduced into the brachial artery. Coronary angiograms, which were obtained immediately, disclosed extreme narrowing of the left main trunk and delayed filling of the left anterior descending artery without visualisation of the circumflex artery (Fig. 2a). Collateral vessels to both the left anterior descending and circumflex arteries from the right coronary artery were seen (Fig. 2b).

Narrowing of the left main trunk became less severe and collateral vessels disappeared when the chest pain was relieved by sublingual administration of 0·3 mg glyceryl trinitrate. Then 0·1 mg ergonovine maleate was administered into the sinus of Valsalva. Two minutes later chest pain recurred. Both the electrocardiogram and coronary angiograms showed simi-
lar findings to those seen during the spontaneous attack of pain.

The left main trunk had minimal irregularity on the arteriograms obtained after an additional 0.6 mg glyceryl trinitrate sublingually and 10 mg isosorbide dinitrate into the sinus of Valsalva (Fig. 2c). The left anterior descending, circumflex (Fig. 2c), and right coronary artery (Fig. 2d) were free from obstruction. The collateral vessels were not seen (Fig. 2d).

Discussion

Coronary spasm plays an important role in the genesis both of the variant form of angina pectoris and angina occurring at rest with ST segment depression.\(^1\) It may be provoked by exercise accompanied by ST segment elevation\(^2\) or depression,\(^3\) and it frequently develops spontaneously during coronary arteriography.\(^4\,^5\) The occurrence of spasm of the left main trunk, however, is relatively uncommon.\(^4\,^5\) It has been ascribed to mechanical irritation of the catheter,\(^6\,^9\) but the spasm seen in our cases cannot have been induced in this way because chest symptoms occurred with ST segment depression before the catheter was introduced into the lumen of the left coronary artery. Furthermore, similar spasm was evoked by leg exercise in case 1 and administration of ergonovine maleate in case 2; it has been shown that there are similarities between spontaneous spasm and spasm provoked by ergonovine maleate.\(^11\,^13\)

Collateral vessels were seen transiently during spasm in our cases. Collateral channels are thought to exist anyway,\(^14\,^15\) though under normal conditions they are not functional. It is likely that the perfusion pressure gradient between the right and left coronary artery produced by spasm of the left main trunk brought such channels into play.\(^16\) This phenomenon was not observed in previous studies.\(^5\,^7\)

Narrowing of the left main trunk should be carefully assessed because it has serious clinical implications.\(^17\,^18\) Murphy et al.\(^9\) emphasised that spasm should particularly be suspected in cases of isolated obstruction of the trunk because atherosclerotic obstruction is usually associated with multiple vessel involvement.\(^17\,^18\) Angiographic demonstration of collateral vessels does not confirm that a stenosis is organic. Sufficient nitrites must be given to relieve spasm lest it should be mistaken for fixed obstruction.
Spontaneous spasm of left main trunk

Fig. 2 (a) and (c) Left coronary arteriogram. (b) and (d) Right coronary arteriogram. (a) and (b) Obtained during spontaneous chest pain attack. The arrows 1, 2, and 3 indicate the collateral vessel from the right coronary artery to the left circumflex artery, the diagonal branch, and the left anterior descending artery, respectively. (c) and (d) Obtained after administration of nitrites.

References

17. Lim JS, Proudfoot WL, Sones FM Jr. Left main coronary


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