Clinical practice

Acute myocardial infarction due to myocardial bridge

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Myocardial bridge (MB) is regarded as a common anatomic variant rather than a congenital condition anomaly, defined as the intramyocardial course of a portion of the coronary artery. It was first mentioned by Rayman in 1737 and first described by Grainicianu in the early 1920s. The current gold standard for diagnosing MB is coronary angiography with the typical systolic compression of the epicardial coronary vessel (milking effect). MB usually locates in the middle segment of the left anterior descending (LAD) coronary artery. A recent study showed that the distribution of MB was almost in the middle and distal segments and no MB was found in the proximal segment. MB has been considered as a benign condition and the significance of an MB to myocardial ischemia remains controversial. Recently, some researches showed the fact that MB could cause angina pectoris, myocardial fibrosis, life-threatening arrhythmia and even sudden cardiac death. In this case, we reported a patient with acute myocardial infarction due to a MB located in the proximal segment of the LAD.

A 45-year-old healthy man, with no history of chest pain or cardiac risk factors, was admitted to our emergency department, complaining of left-sided chest pain, dyspnoea, and weakness for about an hour. Blood pressure values were 100/60 mmHg, the heart rate was 60 beats/min, and the oxygen saturation was normal. The initial electrocardiogram (ECG) was performed (Figure 1A). This ECG showed normal sinus rhythm and QS in leads V1–V3. Chest radiograph was normal. Initially the patient was given medical treatment including subcutaneous low molecular weight heparin, aspirin, clopidogrel, statin. Serum chemistry revealed that the elevated peak levels of cardiac troponin I (10.78 μg/L), creatine kinase (4178.8 U/L), creatine kinase isoenzyme (277.9 U/L) in 24 hours from the beginning of his chest pain. In consideration of these diagnostic findings, the patient was referred for emergency cardiac catheterization. Repeated angiography after intracoronary injection of 200 μg nitroglycerin revealed no significant coronary artery stenosis but a myocardial bridge about 4 cm in length with 90% narrowing by systolic compression (Figure 1B) and recovered normally in diastole (Figure 1C) in the proximal segment of the LAD. There was normal antegrade flow (TIMI III) in the LAD distal to the MB segment without any evidence of thrombus. Right coronary artery was normal. Because the patient refused to accept surgical treatment and the stent implanting, we decided upon a conservative treatment.

The patient was subsequently treated with some drugs including a beta-blocker, a calcium-channel blocker (CCB), a statin, and aspirin and reported reduced chest pain in the clinical follow-up.

MB is defined as the intramyocardial course of the coronary artery. For a long time, MB was regarded as a variant without any hemodynamic or physiological relevance because left coronary flow is maximal during diastole. So it is often considered as a benign anatomic variant or an incidental finding without any significance. However, recent studies have presented with the fact that MB could lead to some serious myocardial ischemic conditions. Several kinds of mechanisms were considered to play a role in the harmful outcomes of the MB. Firstly,

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MB promotes the progression of atherosclerosis. Secondly, myocardial ischemia might be a consequence of tachycardia. Finally, coronary vasospasm might be also associated with MB. However, management of patients with MB is still controversial. The current guideline recommends that both beta-blocker and CCB are the first-line drugs for the treatment of MB patients. But the conventional medical therapy was not enough to treat recurrent chest pain in the MB patients and stenting was not recommended with the risk of stent thrombosis and restenosis. Xu et al suggested that supra-arterial myotomy should be the first-choice treatment in symptomatic patients with MB who have failed medical therapy.

REFERENCES

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