PRIMARY ANGIOPLASTY FOR ACUTE ISOLATED RIGHT VENTRICULAR MYOCARDIAL INFARCTION

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Summary

Right ventricular myocardial infarction accompanies inferior myocardial infarction in 30 to 50 percent of cases. However isolated right ventricular myocardial infarction has rarely been diagnosed, and is seen in fewer than 3 percent of all cases of acute miyocardial infarction. Because right ventricular infarction is associated with increased rates of morbidity and mortality, successful reperfusion has gained importance in treatment. Herein we present two separate cases of isolated right ventricular myocardial infarction successfully treated by primary angioplasty. ***(Arch Turk Soc Cardiol 2003;31:290-3)***

Key words: *Right ventricle, myocardial infarction, angioplasty*

Özet

Akut İzole Sağ Ventrikül Miyokard İnfaktüsü için Primer Anjiyoplasti

Sağ ventrikül miyokard infarktüsü akut inferiyor miyokard infarktüslerin %30-50'sine eşlik etmektedir. Ancak, izole sağ ventrikül miyokard infarktüsü tanısı nadir olarak konmaktadır ve tüm akut miyokard infarktüslü hastaların %3'ünden azını oluşturmaktadır. Sağ ventrikül miyokard infarktüsünde morbidite ve mortalite yüksek olduğundan başarılı bir reperfüzyon tedavisi önemlidir. Biz bu yazıda primer anjiyoplasti ile tedavi edilen 2 ayrı izole sağ ventrikül miyokard infarktüsü olgusunu sunuyoruz. ***(Türk Kardiyol Dern Arş 2003;31:290-3)***

Anahtar kelimeler: *Sağ ventrikül, miyokard infarktüsü, anjiyoplasti*

Right ventricular myocardial infarction (RVMI) accompanies inferior myocardial infarction in 30 to 50 percent of cases[1]. However, isolated RVMI is rare, and accounts for less than 3% of all cases of acute myocardial infarction[2]. Isolated RVMI can occur in the setting of acute occlusion of a nondominant right coronary artery, or isolated occlusion of one of the right ventricular branches of right coronary artery[3]. In this paper, we present two cases of isolated RVMI treated by primary angioplasty.

Case 1

A 56-year-old male without past history of cardiovascular disease was admitted with new onset chest pain lasting 30 minutes. On arrival, physical examination was unremarkable. Electrocardiography (ECG) at admission showed negative T waves in

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leads V3-6. Troponin-T level 6 hours after the onset of the pain was 0.16ng/ml. The patient was transferred to the coronary care unit with the diagnosis of acute coronary syndrome. Tirofiban bolus and infusion was initiated with enoxaparin, aspirin and clopidogrel. Also nitroglycerin and metoprolol was administered. The patient was stable during tirofiban administration for 48 hours. However the day after the cessation of the tirofiban infusion the patient had rest pain despite nitroglycerine infusion. The ECG demonstrated negative T wave in leads V3-6, but ST- segment elevation in leads V4R-6R. Emergent coronary angiography revealed total occlusion in rudimentary proximal portion of the right coronary artery and normal left dominant coronary artery. This was interpreted as acute isolated right ventricular ischemia and emergent coronary intervention was performed. Heparin-coated 12-mm Jostent (Jomed, Rangendingen, Germany) was deployed after initial balloon dilatation. The final balloon diameter was measured 2.7 mm within the stent. Thrombolysis in myocardial infraction (TIMI) grade 3 flow was obtained after successful stent implantation. Serum creatine kinase (CK) and CK-MB levels were 531 IU/L and 90 IU/L, respectively at 12 hours after the procedure. The patient was discharged without any complication. Repeat coronary angiography six months after the initial procedure showed no restenosis within stent. (Angiographic images of this patient were reviewed by the editorial board)

Case 2

A 68-year-old male presented with severe precordial pain lasting 6 hours. The patient had new onset exertional angina in the past week and did not receive any medication. On admission the patient was hypotensive (80/60 mmHg) and otherwise the physical examination was unremarkable. The Kussmaul sign was absent. The ECG revealed negative T waves in leads DI, avL and V3-6 and ST segment elevation in leads V3R-6R. Intravenous saline infusion was immediately administered to restore blood pressure. The patient then was taken to the cardiac catheterization laboratory and coronary angiography showed totally occluded non-dominant right coronary artery (Fig. 1) and dominant normal left coronary artery. Subsequently, balloon dilatation was performed with 2.0 20 mm balloon catheter (Europass, Johnson&Johnson Corp, FL). A stent was not deployed because of small vessel size (2mm) (Fig. 1a). Patient's pain was relieved, and hemodynamics improved with concomitant rapid infusion of 1500 mL of saline, immediately after the procedure. Intra-arterial blood pressure was measured 110/75 mmHg. Intravenous tirofiban infusion was initiated during the procedure and continued for 48 hours. The patient also received aspirin, enoxaparin and clopidogrel. Serum creatine kinase (CK) and CK-MB levels were 1220 IU/L and 82 IU/L, respectively at 12 hours after the procedure. The patient was discharged on the seventh day uneventfully. The patient reached 6-month clinical follow-up without a cardiac event, but did not accept to undergo repeat coronary angiography.

Figure 4: *In the second case, coronary angiogram demonstrated an occluded right coronary artery.*

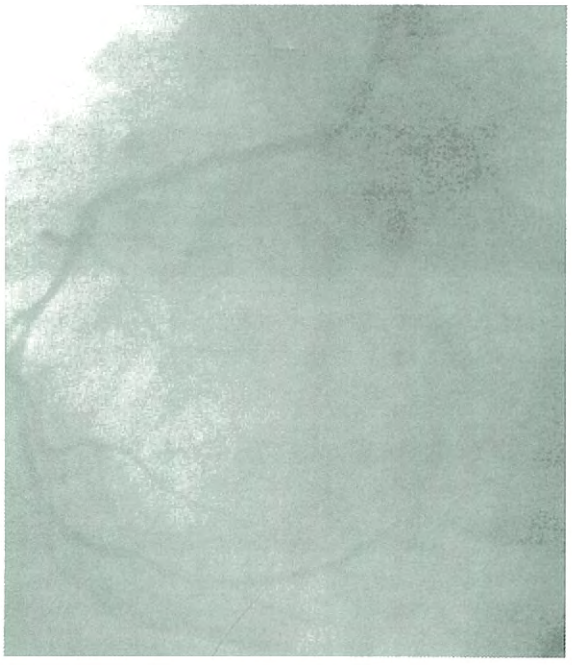

Figure 5: *Angiogram immediately after primary angioplasty without stent implantation shows a non-dominant right coronary artery.*

DISCUSSION

Right ventricular myocardial infarction accompanies inferior myocardial infarction in 30 to 50 percent of cases[1]. Isolated right ventricular infarction is rarely been diagnosed antemortem and is seen in fewer than 3 percent of all cases of acute myocardial infarction[2]. Electrocardiography criterion for right ventricular infarction is ST-segment elevation of >0.1 mV in right precordial chest leads[4]. However in rare cases, ECG changes may mimic anterior myocardial infarction[5]. The ECG changes in our cases were precordial T wave negativity suggesting anterior ischemia. However these changes were secondary to ischemia of anterior wall of the right ventricle.

Early diagnosis and treatment is crucial in right ventricular infarction because an irreversible cycle of low stroke output of right and left ventricles may ensue. Furthermore, exacerbation of right ventricular distention by volume loading partly explains why this therapy does not improve cardiac output and systemic arterial pressure in patients with right ventricular infarction. Inotropic therapy added to volume loading has been successful in improving right ventricular stroke output and systemic arterial pressure in patients with hemodynamically significant right ventricular infarction. However, this therapy may increase the oxygen demand in the left ventricle, thereby inducing ischemia and arrhythmias. Whether revascularization of the right ventricle by primary angioplasty after the onset of infarction would improve clinical outcome in patients who present with clinically important signs of isolated right ventricular infarction is not known.

The presented cases are similar in the sense that they are both examples of isolated right ventricular infarction with ECG changes mimicking anterior ischemia, however they differ in that one is high risk unstable angina evolving into myocardial infaction, and the other is hemodynamically unstable acute myocardial infarction on presentation. Both were successfully revascularized by percutaneous intervention and the culprit lesion was total occlusion of a non-dominant right coronary artery. The invasive management strategy in these cases was augmented by the use of antiplatelet agents. It is well known that primary coronary angioplasty with stenting improves clinical outcome in patients with acute left ventricular (anterior or inferior) myocardial infarction[6]. However, there are sparse data in the literature about the value of percutaneous coronary intervention in isolated acute right ventricular myocardial infarction.

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