Introduction

The term of double or combined myocardial infarction (MI) is defined as the simultaneous ischemic injury of two different myocardial territories, raising the possibility of multiple culprit lesions [1]. This condition is rarely reported in clinical studies [2], but there is intravascular ultrasound evidence that multiple unstable plaques coexist in different major epicardial coronary artery branches at the time of an acute coronary syndrome [3]. The simultaneous occlusion of two major coronary arteries is frequently associated with hemodynamic and electrical instability and requires a time-limited and challenging management [4]. Although the preferred treatment of the acute MI with ST segment elevation (STEMI) is primary percutaneous coronary intervention (PCI) [5,6], the anomalous origin of a coronary artery could represent an important challenge during this procedure, contributing to additional delay before revascularization [7,8].

On repeated ECG appeared only PQ prolongation, but with right bundle branch block (RBBB) and 1 mm STE in leads V4-V6 besides the inferior STE. After administration of full-dose thrombolytic treatment, the patient was immediately transferred to the regional PCI center, the Emergency Institute for Cardiovascular Diseases and Transplantation of Tîrgu Mureș. He arrived with persistent angina, in Killip class II, with STE resolution >50% in the inferior leads, but persistence of PQ prolongation, RBBB and 2.5 mm STE in leads V2-V6 (figure 2).

Emergent coronary angiography (figure 3) revealed acute occlusion of the middle left anterior descending artery and a thrombus containing, severely stenotic lesion in the second segment of the anomalously originated right coronary artery (RCA). No external compression of the...
proximal RCA was noted. The selective cannulation of the RCA was possible with Judkins Left catheters only. Rescue PCI with implantation of 2 bare metal stents in the LAD and RCA, respectively, was performed nine hours after pain onset, using the same Judkins Left 4.0 guiding catheter (figure 3).

After an uneventful in-hospital evolution, the patient was discharged asymptomatically, with a left ventricular ejection fraction of 35%. At the 6-months follow-up visit he had no angina or heart failure symptoms. At this time, computed tomography angiography revealed patent stents (figure 4) and confirmed the high, acute-angle takeoff of the RCA arising above the sinotubular junction, with the first segment situated between the aorta and the pulmonary artery (figure 4).

At 1 year after de acute event the patient is still doing well, without significant symptoms (figure 5).

Discussions
Although very rarely reported in clinical registries[2], pathologic evidence of simultaneous thrombotic occlusion of more than one coronary artery is not uncommon[9]. This could be explained by the fact that these patients often have extensive myocardial injury and die before arriving to the hospital [10]. As clinical evidence is mainly based on case reports, it is little known about the pathophysiology of double coronary artery thrombosis [1,4,10,11]. It is supposed that the prothrombotic and proinflammatory conditions associated with the first MI may provoke additional acute thrombosis of other unstable atherosclerotic lesions, especially in the case of sequentially appearing coronary artery thrombosis during the same acute clinical event [10].

In our case the ECG proved to be a good and valuable diagnostic tool and an important prognostic indicator, its aspect correlating well with the angiographic findings and thus help to stratify the patient for more aggressive and appropriate forms of therapy. Although thrombolysis was successful only in the case of the RCA occlusion, it was probably life-saving. According to current guidelines, multivessel PCI in acute MI patients with STE is reserved for cases with cardiogenic shock, where all critical lesions should be addressed during the same emergency interventional procedure [5,6]. However, in the absence of shock,
there are no specific recommendations for cases with multiple culprit lesions. Although there was no flow-limitation in the RCA after thrombolysis, considering the electrocardiographic and angiographic findings, PCI of the RCA was attempted during the same interventional procedure. In addition, due to the anomalous origin of the RCA, the same guiding catheter could be used for the intervention-al treatment of both acute lesions. Although Judkins left guiding catheters are feasible for primary PCI of culprit lesions localized in RCA with anomalous origin [7], the intervention is done with reduced back-up support [8]. In addition to the increased difficulty of the PCI procedure, the anomalous proximal interarterial course of the RCA between the aorta and the pulmonary artery could have further ischemic consequences [12]. However, given the absence of luminal compression on angiography and the asymptomatic long-term evolution, surgical correction of the congenital anomaly was not proposed. Despite the complexity of the case, the combination of reperfusion therapies resulted in a good immediate outcome, followed by favourable long-term evolution.

Conclusions
This is the first report of a combined MI caused by acute, sequentially occurring thrombotic occlusion of two coronary arteries, one of them with anomalous origin, in a patient treated by rescue PCI following partially successful thrombolysis. The combined, pharmaco-invasive strategy appears to be a feasible approach for the treatment of these critically ill patients.

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Conflict of interest
The authors declare that they have no conflict of interest.

References