

## IMAGES IN CARDIOLOGY

# Manual thrombus aspiration's essential role in selected STEMI cases

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**Abstract:** World-wide, the most frequent cause of death is coronary artery disease (CAD), responsible, every year, for the death of seven million people, accounting for 12.8% of all deaths.<sup>1</sup> Nevertheless, the incidence of acute myocardial infarction (AMI) and death rates after AMI are declining in most countries, especially in the developed ones.<sup>2-4</sup> The survivors of AMI are at high risk of developing a recurrent myocardial infarction or other manifestations of cardiovascular disease, such as stroke<sup>5-8</sup>. We present the case of a male patient, 80 years old, with a history of inferior myocardial infarction and angioplasty with two bare metal stents on the right coronary artery (2012), who presented an episode of loss of consciousness, followed by motor deficit of the lower limbs and dysarthria. The head CT did not show any acute hemorrhagic lesions, but the patient had elevated myocardial necrosis biomarkers and the ST segment elevation in the inferior leads on the electrocardiography (EKG). He was diagnosed with inferior ST-segment elevation myocardial infarction (STEMI) and transferred to our clinic for further investigations and treatment.

**Keywords:** myocardial infarction, ST-segment elevation myocardial infarction, thromboaspiration

**Rezumat:** Cea mai frecventă cauză de deces, la nivel mondial, este boala coronariană. Aceasta este responsabilă, anual, pentru 7 milioane de decese, acestea reprezentând 12.8% din totalul deceselor de orice cauză.<sup>1</sup> Cu toate acestea, incidența infarctului miocardic și a deceselor post-infarct este în scădere, în special în țările dezvoltate.<sup>2-4</sup> Pacienții care au supraviețuit unui infarct miocardic acut sunt la risc înalt de a dezvolta un al doilea episod, precum și alte manifestări ale bolii cardiovasculare, cum ar fi accidental vascular cerebral.<sup>5-8</sup> Prezentăm cazul unui pacient în vârstă de 80 ani, cu istoric de infarct miocardic inferior și angioplastie cu două stenturi metalice simple la nivelul coronarei drepte (2012). Acesta a prezentat un episod de pierdere a conștiinței, urmat de deficit motor al membrelor inferioare și dizartrie. Examinarea CT cerebral nu a decelat leziuni hemoragice acute, dar pacientul a prezentat creșterea enzimelor de necroză miocardică, precum și supradenivelare de segment ST în teritoriul inferior; decelabilă pe traseul ECG. Astfel se stabilește diagnosticul de infarct miocardic cu supradenivelare de segment ST (STEMI) în teritoriul inferior și pacientul este transferat către clinica noastră pentru continuarea investigațiilor și tratament de specialitate.

**Cuvinte cheie:** infarct miocardic, infarct miocardic cu supradenivelare de segment ST, tromboaspirație

## INTRODUCTION

**Case report:** We present the case of a male patient, 80 years old, hypertensive, dyslipidaemic, with a history of inferior myocardial infarction and angioplasty with 2 BMS on the right coronary artery (2012), who presented an episode of loss of consciousness, followed by motor deficit of the lower limbs and dysarthria. He was admitted to neurology and a head CT scan was performed, this showed no acute hemorrhagic lesions. The myocardial biomarkers were raised and the electrocardiography (EKG) showed ST segment elevation

in the inferior leads. The patient was diagnosed with inferior ST-segment elevation myocardial infarction (STEMI) and was referred to our clinic for further investigations and treatment.

At admission, the patient accused no angina or dyspnea, but was somnolent and had crural motor deficit. The myocardial necrosis markers were elevated and the EKG showed persistent ST segment elevation in DII, DIII, aVF with negative T waves and Q waves and ST segment depression in the reciprocal leads. Echocardiography showed a moderately depressed ejection

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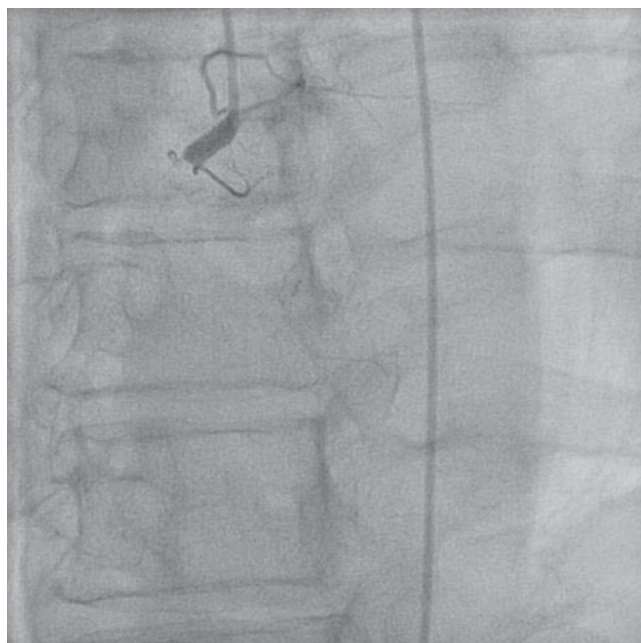
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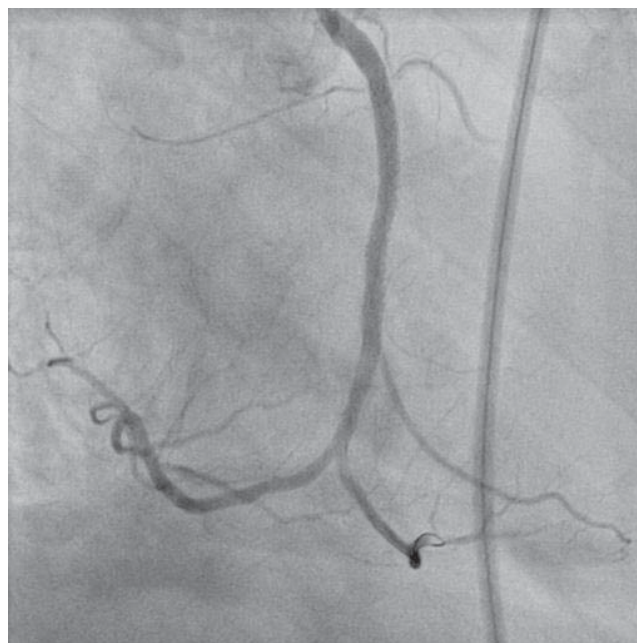
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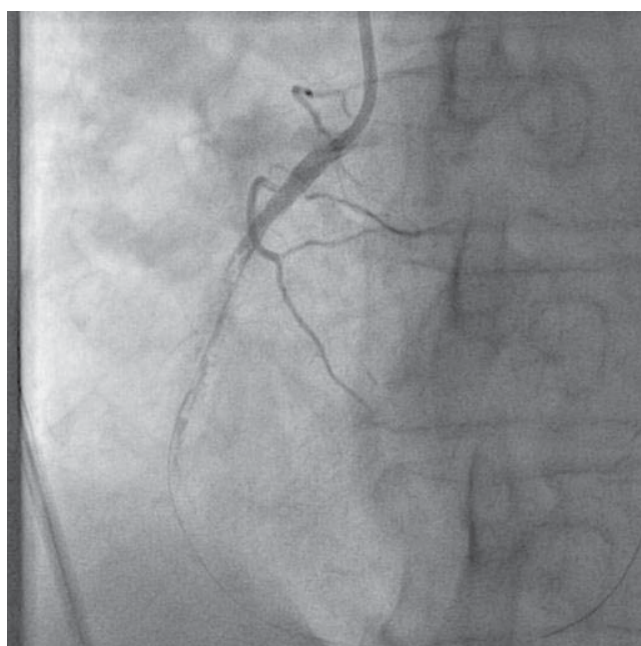
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**Figure 1A.** Proximal occlusion of RCA.



**Figure 1C.** Final PCI result on RCA.



**Figure 1B.** RCA – high amount of thrombotic material.

on fraction (EF=35%) with akinesia of the inferior wall and apical half of the interventricular septum and a moderate aortic stenosis.

The patient underwent urgent coronarography, which revealed right coronary artery (RCA) proximal occlusion and 70% calcified stenosis of the left anterior coronary artery. We decided for emergency percutaneous coronary intervention (PCI) on the ri-

ght coronary artery. After the occlusion was passed with a hydrophilic guidewire, we predilated with a semicompliant balloon, but no flow was obtained due to the high amount of thrombotic material. We performed multiple thromboaspiration passages, with the extraction of numerous thrombi and vessel repermeabilization was obtained. A long drug eluting stent was implanted with a very good angiographic result, TIMI 3 flow to distal RCA.

During the hospitalization, the patient's evolution was unfavorable. He started having episodes of atrial fibrillation and non sustained ventricular tachycardia which were successfully treated with amiodarone. On the third day after admission, the patient became agitated and disoriented; the neurological motor deficit was accentuated. A second CT scan was performed which revealed subacute ischemic stroke in the right posterior junctional territory and a chronic subdural hematoma with a minimal shift of the midline structures contralateral. The patient was transferred to a stroke unit for specific treatment where he died 48h later.

## DISCUSSIONS

World-wide, the most frequent cause of death is coronary artery disease (CAD), responsible, every year, for the death of seven million people, accounting for 12.8% of all deaths<sup>1</sup>. Twentysix million people world-wide experience a stroke each year, making it the se-



**Figure 2.** Thrombi removed with aspiration catheter.

cond leading cause of mortality and leading cause of long-term disability. One third of strokes represent intracerebral or subarachnoid hemorrhage, whereas



**Figure 3.** Subacute ischemic stroke in the right posterior junctional territory.

two thirds represent cerebral ischemia<sup>9</sup>. Acute ischemic stroke in patients with acute coronary syndrome is uncommon, but devastating, it occurs in 1-2% of patients and it is the single, strongest risk factor for in-hospital mortality<sup>10</sup>.

Acute MI is a long-established risk factor for ischemic stroke. The association seems causal because overlying areas of akinesia there are often seen thrombi<sup>9</sup>. This could be an explanation for the ischemic stroke our patient developed: he has a moderate depressed left ventricle ejection fraction with area of akinesia. Another explanation could be atrial fibrillation that was documented during his hospitalization.

However, there is little information available, on the type of optimal reperfusion therapy and the antithrombotic adjuvant therapy to be applied to patients with STEMI and acute ischemic stroke<sup>10</sup>.

TASTE and TOTAL studies compared routine manual thrombectomy vs PCI alone to STEMI patients who were undergoing primary PCI. The results revealed that routine thrombectomy did not reduce the risk of cardiovascular death, recurrent myocardial infarction, cardiogenic shock, but was associated with an increased rate of stroke within 30 days<sup>11,12</sup>.

On the other hand, TAPAS study showed thrombus aspiration is applicable in a large majority of STEMI patients with better results regarding reperfusion and clinic outcomes than conventional PCI<sup>13</sup>.

In our case, we decided to use manual thrombus aspiration, due the high quantity of thrombotic material with a good result

## CONCLUSION

Manual thromboaspiration with multiple passages is a simple, cheap and high accessibility method to obtain better results regarding the reduction of distal embolization in selected STEMI patients.

**Conflict of interest:** none declared.

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