

# Predictors of Failed Thrombus Aspiration in Patients Undergoing Primary Percutaneous Coronary Intervention

Felipe A. Baldissera<sup>1</sup>, Anibal P. Abelin<sup>2</sup>, Eduardo Mattos<sup>3</sup>, Alexandre D. Azmus<sup>4</sup>, Renato B. David<sup>5</sup>, Juliana Sebben<sup>6</sup>, Cristiano O. Cardoso<sup>7</sup>, Alexandre S. Quadros<sup>8</sup>, Carlos A. M. Gottschall<sup>9</sup>

## ABSTRACT

**Background:** Aspiration thrombectomy is recommended as an adjunctive method in patients undergoing primary percutaneous coronary intervention (PCI), however, thrombus aspiration failure is relatively frequent. The objective of this study was to evaluate the rate and identify predictors of failed thrombus aspiration in a contemporaneous series of patients. **Methods:** Prospective cohort study including consecutive patients with acute ST-segment elevation myocardial infarction undergoing primary PCI with thrombus aspiration from December 2009 to December 2011. Aspiration thrombectomy was performed at the operator's discretion and success was defined as effective thrombus aspiration by a dedicated catheter with the achievement of a final TIMI flow > 0. **Results:** 1,055 primary PCIs were performed and aspiration thrombectomy was used in 37% of cases with a success rate of 70%. Aspiration thrombectomy success was observed in 254 patients whereas failure was observed in 107 patients. Aspiration thrombectomy failure was associated with age, hypertension, *diabetes mellitus*, dyslipidemia, previous PCI, TIMI risk score, Killip IV, leukocyte count, serum fibrinogen, target vessel reference diameter and preprocedural TIMI 3 flow. Patients with failed thrombus aspiration had a trend towards higher mortality (11.6% vs. 5.9%; P = 0.09). **Conclusions:** Aspiration thrombectomy failure during primary PCI was observed in 30% of the cases and was associated with a trend towards higher mortality. The identification of clinical, laboratory and angiographic predictors may help improve these devices and the technique and enable better patient selection.

**DESCRIPTORS:** Myocardial infarction. Percutaneous coronary intervention. Thrombectomy. Risk factors.

## RESUMO

### Preditores de Insucesso de Tromboaspiração em Pacientes Submetidos à Intervenção Coronária Percutânea Primária

**Introdução:** A tromboaspiração é recomendada como método adjunto à intervenção coronária percutânea (ICP) primária, mas o insucesso em recuperar trombos é relativamente frequente. O objetivo deste estudo foi avaliar as taxas de insucesso de tromboaspiração e identificar seus preditores, em uma série contemporânea de pacientes. **Métodos:** Estudo de coorte prospectivo que incluiu pacientes consecutivos atendidos com infarto agudo do miocárdio com elevação do segmento ST e submetidos à ICP primária com tromboaspiração no período de dezembro de 2009 a dezembro de 2011. Os procedimentos de tromboaspiração foram realizados por decisão do operador, e o sucesso foi definido como aspiração efetiva de trombo pelo cateter dedicado, com recuperação do fluxo coronário (fluxo TIMI > 0). **Resultados:** Foram realizadas 1.055 ICPs primárias, sendo que a tromboaspiração foi utilizada em 37% dos casos, com taxa de sucesso de 70%. Foram identificados 254 pacientes com sucesso e 107 com insucesso da tromboaspiração. Insucesso de tromboaspiração foi associado a: idade, hipertensão, *diabetes mellitus*, dislipidemia, ICP prévia, escore de risco TIMI, Killip IV, contagem de leucócitos, fibrinogênio sérico, diâmetro de referência do vaso-alvo e TIMI 3 pré-procedimento. Pacientes com insucesso da tromboaspiração apresentaram tendência a maior mortalidade (11,6% vs. 5,9%; P = 0,09). **Conclusões:** Insucesso de tromboaspiração durante ICP primária ocorreu em 30% dos casos e esteve associado a tendência de maior mortalidade. A identificação de preditores clínicos, laboratoriais e angiográficos pode auxiliar no aprimoramento desses dispositivos e em sua técnica, além da escolha de pacientes mais adequados para seu emprego.

**DESCRIPTORES:** Infarto do miocárdio. Intervenção coronária percutânea. Trombectomia. Fatores de risco.

<sup>1</sup> Physician at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>2</sup> Physician at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>3</sup> Physician at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>4</sup> Interventionist Cardiologist Physician at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>5</sup> Medicine Undergraduate at Universidade Federal de Ciências da Saúde de Porto Alegre. Porto Alegre, RS, Brazil.

<sup>6</sup> Biologist. Hemodynamics Service of the Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>7</sup> Interventionist Cardiologist Physician at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>8</sup> Interventionist Cardiologist Physician at the Hemodynamics Service at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

<sup>9</sup> Interventionist Cardiologist Physician at the Hemodynamics Service at Instituto de Cardiologia/Fundação Universitária de Cardiologia. Porto Alegre, RS, Brazil.

**Correspondence to:** Alexandre S. Quadros. Unidade de Pesquisa do Instituto de Cardiologia da Fundação Universitária de Cardiologia. Av. Princesa Isabel, 395 – Santana – Porto Alegre, RS, Brazil – CEP 90620-001

E-mail: quadros.pesquisa@gmail.com/alesq@terra.com.br

Received on: 7/1/2013 • Accepted on: 9/5/2013

**C**ardiovascular diseases remain the main cause of death in Brazil.<sup>1</sup> Acute myocardial infarction (AMI) is the most severe manifestation. Mechanical recanalization treatment is the best choice if this procedure is available in the first 12 hours, thereby decreasing the mortality, when compared with fibrinolytics.<sup>2</sup>

The presence of an intracoronary thrombus is associated to worse coronary flow and myocardial perfusion, which can be quantified by Thrombolysis in Myocardial Infarction (TIMI)<sup>3</sup> classification and by the degree of myocardial blush,<sup>4</sup> respectively. Moreover, the clinical outcome is worse in this subgroup, both in the in-hospital phase and in the late phase.<sup>5-7</sup> Coronary thrombus is also a predictor of late thrombosis.<sup>8</sup>

Coronary thrombus is present in most manifestations of acute coronary syndrome, with high prevalence in patients with AMI and ST-segment elevation. To reduce the thrombus burden by pharmacologic means, thrombolytic, antiplatelet, anticoagulant agents, and glycoprotein IIb/IIIa inhibitors are used. Devices for mechanical removal are advantageous versus antithrombotic agents, because these procedures do not increase the risk of bleeding. Aspirators may be electronic or manual, and the latter type is more popular, for its simplicity and costs. Despite the increasing use of pharmacological and mechanical therapy, distal coronary embolization may occur in 6%-15% of cases of AMI,<sup>9</sup> causing decreased tissue perfusion, with consequent increase in AMI extent and mortality.<sup>7,8</sup>

There are several clinical trials evaluating the efficacy of devices for thrombus aspiration in mechanical recanalization procedures for AMI. A meta-analysis of these studies showed an improvement of the surrogate outcomes related to myocardial perfusion. In addition, some studies have suggested improvement of perfusion, myocardial blush, ST-segment resolution, and mortality,<sup>10-12</sup> and the effectiveness in the implementation of thrombus aspiration depends of clinical and angiographic factors.<sup>13</sup>

The aim of this study was to evaluate failure rates of thrombus aspiration, with identification of their predictors in a contemporary cohort of patients undergoing primary percutaneous coronary intervention (PCI), and cardiovascular outcomes according to the result of thrombus aspiration.

## METHODS

### Patients

This was a prospective cohort study that included all AMI patients undergoing primary PCI in Instituto de Cardiologia da Fundação Universitária de Cardiologia do Rio Grande do Sul (IC/FUC) in the period from December 2009 to December 2011. The project was approved by the ethics committee, and all patients received information about the study and signed an informed consent.

The inclusion criterion was AMI with indication of primary PCI by the attending physician. AMI was defined as a typical chest pain at rest associated with persistent ST-segment elevation of at least 1 mm in two contiguous leads in the frontal plane, or 2 mm in the horizontal plane, or the presence of a typical chest pain at rest in patients with new (or presumably new) left bundle branch block. The exclusion criteria were chest pain lasting > 12 hours, age < 18 years, or no written consent to participate in the study.

### Clinical and angiographic characteristics

All patients were evaluated immediately after the hospital admission, and their clinical, angiographic, and laboratory data were recorded and stored in a dedicated database. The patients received a daily visit from one of the researchers to assess the occurrence of in-hospital outcomes.

The angiographic evaluations were performed in at least two projections by experienced surgeons, using a previously validated digital electronic system (Axiom Artis; Siemens – Munich, Germany) and intracoronary nitroglycerin was routinely administered in doses of 100 to 200 mcg prior to the measurements. The diameter of the target vessel was defined as the average of luminal diameters proximal and distal to the lesion, and the stenosis severity was measured in two orthogonal projections. The length of the lesion was measured “shoulder to shoulder”, and long lesions were considered as singular in the presence of a normal arterial segment < 10 mm between them. The coronary flow was evaluated before and after the procedures, and described according to TIMI criteria.<sup>3</sup> The myocardial perfusion was evaluated by myocardial blush, as previously described.<sup>4</sup>

### Primary PCI procedures

The IC/FUC is a tertiary interventional cardiology center that performs approximately 2,500 coronary interventions per year. Thrombus aspiration was performed with one of three manual suction catheters available: Export (Medtronic Vascular Inc. – Santa Rosa, USA), Diver CE (Invatec – Brescia, Italy), or Pronto (Vascular Solutions – Minneapolis, USA). The aspects related to the procedure, such as access route, administration of glycoprotein IIb/IIIa inhibitors and number of implanted stents, as well as the decision for conducting the thrombus aspiration, were left to the surgeons' discretion. The thrombus aspiration was performed before the balloon dilation (as described in TAPAS study),<sup>10</sup> with several passages, if necessary. The intra-aortic balloon was used only in patients with cardiogenic shock.

The drugs used in the initial care and the indication for primary percutaneous coronary intervention were left to the discretion of the care team, according to the clinical routine. All patients received a loading dose

Download English Version:

<https://daneshyari.com/en/article/3011850>

Download Persian Version:

<https://daneshyari.com/article/3011850>

[Daneshyari.com](https://daneshyari.com)