

# Same-day hospital discharge percutaneous transluminal angioplasty: can we consider it the strategy of choice during the COVID-19 pandemic?

Angioplastia coronaria con alta hospitalaria en el día: ¿podemos considerarla como la estrategia de elección durante la pandemia COVID 19?

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## ABSTRACT

The better understanding of ischemic heart disease, associated with the progress of endovascular techniques, has positioned percutaneous coronary intervention (PCI) as a safe and effective therapeutic method. Currently, scheduled PCI is a procedure with a very low probability of presenting a serious complication in the first 24 hours. Various protocols have successfully applied the same-day discharge PCI strategy in selected patients, with good results. This initially very restricted strategy is impressive to represent a viable alternative. This review attempts to address the issue, its relevance in routine practice, and in this particular moment of healthcare medicine during the COVID-19 pandemic.

**Keywords:** percutaneous coronary interventions, same day discharge PCI, COVID-19 pandemic.

## RESUMEN

El mejor entendimiento de la cardiopatía isquémica, asociado al progreso de las técnicas endovasculares, ha posicionado a la angioplastia transluminal coronaria (ATC) como un método terapéutico seguro y eficaz. Actualmente, la ATC programada constituye un procedimiento con una muy baja probabilidad de presentar una complicación grave en las primeras 24 horas. Diversos protocolos de trabajo han logrado aplicar la estrategia de ATC con alta en el mismo día, en pacientes seleccionados, con buenos resultados. Esta estrategia, inicialmente muy restringida, impresiona representar una alternativa viable. La presente revisión intenta abordar el tema, su relevancia en la práctica habitual y el lugar que ocuparía en este particular momento de la medicina asistencial durante la pandemia COVID-19.

**Palabras clave:** angioplastia coronaria, angioplastia coronaria con alta en el día, pandemia COVID-19.

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## INTRODUCTION

Cardiovascular disease is a major health issue in developed countries<sup>1</sup>. In this context, the better understanding of ischemic heart disease associated with the advance of endovascular techniques has turned the percutaneous transluminal angioplasty (PTA) into a safe and therapeutic procedure. Twenty-five years ago, a high percentage of patients who required myocardial revascularization surgery (MRS) with day-or-week long hospital stays and who had other associated comorbidities can now be treated with a PTA with regular follow-up 24 hours after the procedure<sup>2</sup>.

Currently, eligible PTAs are a procedure with very low chances of serious complications within the first 24 hours after the procedure<sup>3</sup>. Also, radial access facilitates very fast recoveries and avoids the risk of femoral artery bleeding that can lead to serious complications<sup>2</sup>. Over the past two decades, several proposals have been made to shorten the hospital stay of patients treated with PTA by using the same-day modality.

## CRITERIA PROPOSED BY THE SOCIETY FOR CARDIAC ANGIOGRAPHY AND INTERVENTIONS FOR THE SELECTION OF PATIENTS ELIGIBLE TO UNDERGO PTA WITH SAME-DAY HOSPITAL DISCHARGE

The criteria initially proposed by the *Society for Cardiac Angiography and Interventions* (SCAI) to include a patient in a same-day hospital discharge program are<sup>4,5</sup>:

- Stable angina or silent ischemia.
- Normal ejection fraction.
- Preload with thienopyridines.
- Lack of comorbidities.
- Single-vessel disease.
- Single-vessel PTA with only 1 stent <28 mm via radial, humeral or femoral access with an occluder device or safe manual compression.
- Lack of complications.
- A distance of less than 32 kilometers from the patient's home to the PCI-capable center.
- Proper home care at and access to the emergency system.

These recommendations limited access to PTA with same-day hospital discharge percutaneous transluminal angioplasty (SDHD-PTA) to a small group of patients despite the good results reported by several clinical trials, reviews, and meta-analyses with much wider criteria<sup>6-9</sup>. Back in 2018, SCAI published an expert consensus document update extending the indication to the following groups<sup>10</sup>:

- Preload with thienopyridines (not exclusive).

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- Presence of compensated comorbidities: diabetes, heart failure, COPD, chronic kidney disease, peripheral vascular disease.
- Multi-vessel PTA, chronic total coronary occlusions without limits to the number or length of the stents used.

## INTERNATIONAL EXPERIENCE

The first large scale clinical trials ever conducted were the EPOS and the EASY<sup>6,7</sup>. The first one published in 2007 included 800 patients randomized to undergo an elective angioplasty followed by 4-hour hospital discharges versus 24-hour hospital stays. Patients with previous PTA or myocardial revascularization surgery, left main coronary artery disease or multivessel disease were treated with an elective angioplasty. The presence of comorbidities or heart failure were not considered exclusion criteria. Femoral access was used with doses of 100 mg of aspirin followed by the intra-arterial administration of 5000 units of sodium heparin or 7500 units for procedures over 90 minutes. In cases of stent implantation an additional 100 mg of aspirin, 300 mg of IV clopidogrel, and 75 mg/day for a month were administered. Hemostasis was manual. Although the inter-group results did not show any significant differences, there was a non-negligible crossing rate towards the hospital stay group.

The EASY trial was published in 2018 included 1005 patients between 2003 and 2005 following an angioplasty performed via radial access in the NSTEMI (non-ST-segment elevation acute coronary syndrome) setting. Patients were randomized to a single bolus of abciximab and SDHD-PTA vs a 12-hour continuous infusion bolus without same-day hospital discharge. No differences were seen between the 2 groups.

The CathPCI registry included over 107,000 patients and showed that elderly patients (69 years to 78 years) with comorbidities, femoral access, ventricular dysfunction, and angioplasty of complex lesions had good results in selected cases<sup>8</sup>.

Successive reviews and meta-analyses showed no differences of mortality, myocardial infarction, and MACE between the SDHD-PTA strategy and conventional postprocedural management with hospital stays beyond 24-hour mark<sup>9-11</sup>.

## NATIONAL EXPERIENCE

Several observational national experiences have been developed with good results. Back in 2009 an observational protocol included 100 very low-risk patients treated with SDHD-PTA via radial access without complications. Other additional protocols have been designed including more complex patients in the NSTEMI (non-ST-segment elevation acute coronary syndrome) setting. The results of one of these protocols was reported at the annual Argentine Congress of Cardiology of 2016<sup>12</sup>.

An observational, retrospective clinical trial conducted in 2018 included over 600 patients treated via right radial access. The characteristics of patients treated with

SDHD-PTA were compared to those of patients who remained hospitalized. Many of the patients from the SDHD-PTA group were over 70 years and had ventricular dysfunction, some with left main coronary artery disease or previous revascularization surgery and other high-risk criteria. The results of this study did not vary between both groups<sup>13</sup>.

In 2019 we presented the AHORA 6 clinical trial (coronary angioplasty with fast hospital discharge in 6 hours)<sup>14</sup>. This trial was our very first randomized, prospective, and comparative approach on the management of selected patients to undergo a coronary angioplasty with fast hospital discharge in just 6 hours. We compared a group of patients <75 years with stable chronic angina, and an ejection fraction of 30% or higher, no previous MRS, left main coronary artery disease or a single patent vessel. Radial access was used, and patients were divided into 2 cohorts: the intervention group (G1) and the control group (G2). The G1 was closely monitored for 6 hours if the PTA results were optimal and after an independent core lab reviewed the operators performing the procedure. In the absence of symptoms or postprocedural electrocardiographic changes, the patients were discharged the same day with telephone follow-ups that night and the next day. The G2 was treated using the routine clinical practice and was discharged the next day.

After treating nearly 100 patients, we did not see a higher risk in the PTAs performed via radial access with hospital discharges at the 6-hour mark compared to the conventional strategy in selected patients.

## COMMENTS

The same-day hospital discharge percutaneous transluminal angioplasty has proven to be a safe alternative in selected patients. However, some health professionals and institutions are still reluctant to establish programs with this procedure in their therapeutic armamentarium.

The COVID-19 pandemic has impacted the care provided to cardiovascular patients. Recent publications confirm a significant reduction of outpatient practice<sup>15</sup>.

Actually, this is a multifactor phenomenon. Having to create spaces for confinement purposes has reduced the capacity of hospitals to have stay areas available for patients in the intensive care setting. Detecting a patient who tests positive for COVID-19 means even fewer hospital stay areas following the activation of confinement protocols. Finally, in many cases, patients say they do not want to seek medical attention because they fear they may get infected.

Offering an alternative with a short hospital stay in a "green" or "clean" intermediate care setting may be a viable and cost-effective option for the healthcare system. Another important aspect is the need to inform the population on the safety profile of this therapeutic approach.

The new challenge that the COVID-19 pandemic poses for all of us can be an opportunity to rethink our routine clinical practice.

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