



CASE REPORT

Combined rotational atherectomy and aortic balloon valvuloplasty as a bridge to transcatheter aortic valve replacement



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KEYWORDS

Balloon aortic valvuloplasty;
Rotational atherectomy;
High-risk coronary interventions

Abstract Patients with obstructive coronary artery disease and severe aortic stenosis have traditionally been managed with open heart surgery. In the era of transcatheter aortic valve replacement (TAVR) and high-risk coronary interventions many of those patients who were previously considered “terminal” can now be successfully managed with percutaneous coronary intervention (PCI) and TAVR. Although simple PCI can be safely combined with TAVR in the same procedure, high-risk coronary interventions often need to be performed separately. We report the first case of combined rotational atherectomy with balloon aortic valvuloplasty as a bridge to TAVR in a frail patient with complex coronary artery disease and critical aortic stenosis.

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PALAVRAS-CHAVE

Valvuloplastia aórtica com balão;
Aterectomia rotacional;
Intervenções coronárias de alto risco

Aterectomia rotacional combinada e valvuloplastia aórtica com balão como ponte para substituição valvular aórtica percutânea

Resumo O grupo de doentes com doença coronária obstrutiva e estenose aórtica grave foi tratado, conforme é habitual, com cirurgia de coração aberto. Na era de substituição valvular aórtica percutânea (TAVR) e das intervenções coronárias de alto risco, muitos daqueles doentes que foram previamente considerados «terminais», podem agora ser tratados com sucesso com intervenção coronária percutânea (ICP) e com TAVR. Embora a simples ICP possa ser prudentemente combinada com a TAVR no mesmo procedimento, as intervenções coronárias de alto

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risco necessitam muitas vezes de ser efetuadas em separado. Apresentamos o primeiro caso clínico de aterectomia rotacional combinada com valvuloplastia aórtica com balão como ponte para TAVR numa doente frágil com doença coronária complexa e estenose aórtica crítica.
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Introduction

The combination of symptomatic obstructive coronary artery disease (CAD) and severe aortic stenosis (AS) accounts for 25–50% of patients with severe AS and carries important morbidity and mortality.^{1–3} The standard of care has traditionally been surgical aortic valve replacement (SAVR) with coronary artery bypass grafting (CABG). Although isolated SAVR generally carries a low surgical risk, the additional need for CABG significantly raises surgical mortality, especially in the frail and elderly population.^{4–6} Furthermore, incomplete coronary artery revascularization in patients with SAVR is known to increase postoperative mortality.⁷

In the era of transcatheter aortic valve replacement (TAVR) many patients with obstructive CAD and AS who are not candidates for surgery are referred for transcatheter management.

We present a case of complex obstructive CAD with critical AS, treated with combined rotational atherectomy and aortic valvuloplasty as a bridge to TAVR.

Case report

An 84-year-old female with severe symptomatic aortic stenosis was referred to our multidisciplinary team for possible SAVR or TAVR. For the last six months she had experienced progressive angina (Canadian Cardiovascular Society class III) and dyspnea on exertion (New York Heart Association class III) with a recent episode of syncope which resulted in a forehead laceration and ecchymosis. The patient was wheelchair-bound for more than two months due to the presence of activity-limiting symptoms.

Her transthoracic echocardiogram revealed a non-dilated left ventricle with preserved ejection fraction of 60% and moderate concentric hypertrophy. The aortic valve was trileaflet, heavily calcified with a peak transaortic velocity of 5.2 m/s, a mean pressure gradient (PG) of 55 mmHg, a calculated aortic valve area (AVA) of 0.37 cm², an AVA index of 0.26 cm²/m² and absence of aortic insufficiency. The right heart chambers were non-dilated, with mild pulmonary hypertension of 45 mmHg, and the mitral valve showed normal morphology and function.

A previous nuclear stress test performed by the primary care provider before the diagnosis of aortic stenosis revealed a large area of inferior wall ischemia. Consequently, we scheduled an invasive coronary angiogram with left and right heart catheterization, which showed a heavily calcified ostial right coronary artery obstructive lesion of

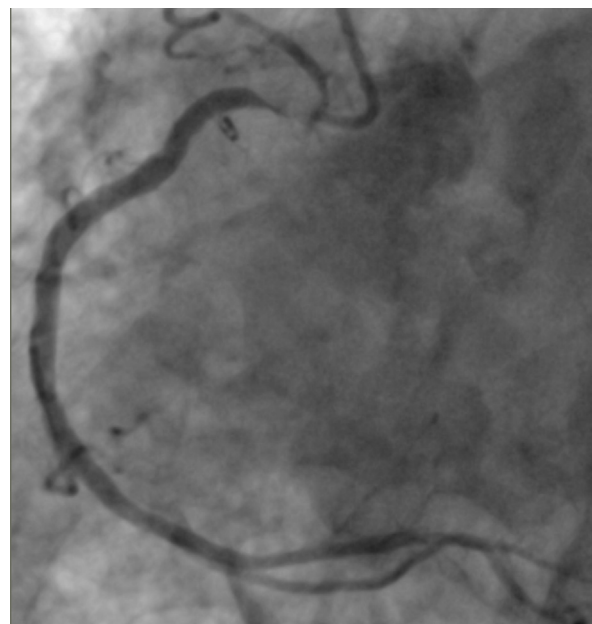


Figure 1 Diagnostic selective right coronary artery angiogram showing ostial calcified subtotal right coronary artery stenosis.

99% (Figure 1) combined with critical aortic stenosis (mean transaortic PG of 44 mmHg and an AVA of 0.3 cm²).

Taking into consideration her overall functional condition, comorbidities and a Society of Thoracic Surgeons (STS) score of 12%, our multidisciplinary team concluded that a transcatheter approach was preferable to open heart surgery. We elected to perform a high-risk percutaneous intervention of the RCA with BAV as a bridge to a staged TAVR. Due to the RCA complexity, requiring an important volume of contrast for PCI, we decided to proceed for a staged PCI of the RCA combined with balloon aortic valvuloplasty (BAV), followed by TAVR after recovery. We felt that this approach would limit the amount of contrast used and would allow conscious sedation and the use of smaller sheaths. We anticipated that the first stage would temporarily improve the patient's angina and functional class for a safer second-stage ad-hoc TAVR procedure. At the same time, in the event of hemodynamic instability during rotational atherectomy or BAV, bail-out emergent TAVR or open surgery could be performed in our hybrid lab.

A 7 French (F) sheath was placed in the left common femoral artery (CFA), after preclosure with two Perclose ProGlide suture-mediated closure systems (Abbott Vascular,

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