

# Evolving patterns in procedural techniques and strategies in patients with heavily calcified coronary lesions

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## RELATED ARTICLE

by Januszek et al,  
see p. 529

Technological advances, together with the growing number of elderly patients referred to catheterization laboratories, are pushing the boundaries of interventional cardiology. Ever more patients with complex coronary disease and serious comorbidities, in whom surgeons declined to perform the procedure due to high operative risk, are being referred for percutaneous coronary intervention (PCI). Among them, heavily calcified coronary stenosis is reported in 1 out of 5 patients presenting with moderate to severe coronary calcification.<sup>1</sup> The latter has been associated with periprocedural complications, malapposition, incomplete stent expansion, and worse clinical outcomes.<sup>2</sup> In the last decades, many tools and techniques have been developed to facilitate treatment and improve prognosis in patients with calcified stenosis, eg, scoring and cutting balloons, rotational and orbital atherectomy, and coronary lithotripsy.

Rotational atherectomy (RA) was introduced in the late 1980s with the intent of plaque debulking, but it was progressively abandoned after disappointing results regarding procedural complications and restenosis.<sup>3</sup> Since drug-eluting stents started to be used, RA has attracted increasing interest in the community of interventional cardiologists as a tool no longer aiming at plaque debulking yet at plaque modification, that is, sufficiently cracking the ring of calcium in order to facilitate balloon expansion and optimal stent deployment. The contemporary RA technique has been described in the European expert consensus document published in 2015 and advocates the use of smaller burrs (burrito-artery ratio <0.7) at lower speed (135 000

to 180 000 rpm) and with shorter RA runs (10 s to 20 s) than in the traditional debulking technique.<sup>4</sup> With such a minimalist approach, RA can be easily adopted without deranging standard PCI settings. For example, it is equally feasible with the radial or femoral arterial approach, there is no need to increase the guiding catheter size in most cases, and the need for temporary pacing occurs less frequently.

In this issue of *Kardiologia Polska* (*Kardiol Pol*, *Polish Heart Journal*), Januszek et al<sup>5</sup> evaluated periprocedural clinical outcomes after RA procedures performed via radial versus femoral access, based on data from the Polish National Registry of Percutaneous Coronary Interventions (ORPKI) collected prospectively between 2014 and 2018. After propensity matching, the incidence of coronary artery perforation was higher in the radial-access group (odds ratio [OR], 0.29; 95% CI, 0.08–0.92;  $P = 0.04$ ) compared with the femoral-access group. The authors should be commended for collecting a very large and representative patient cohort, truly reflective of the evolving pattern of RA adoption in Poland. With 2713 patients, this represents one of the largest available registries on RA, with a proportion of RA over the total number of PCIs performed ( $n = 536\,826$ ) of just 0.5%, probably due to the limited reimbursement of this procedure. Nevertheless, the use of RA is only slightly higher in other European countries, representing 0.8% to 3.1% of the total number of PCIs.<sup>4</sup> The temporal trend in the choice of the access route is the second aspect of the study. At the beginning of the inclusion, in 2014, the femoral approach

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still represented the most often used access route, whereas radial access became the preferred approach over the years, accounting for nearly 65% of the total number of arterial accesses in 2018 (see Figure 2 by Januszek et al<sup>5</sup>). These data are in contrast with the ROTATE registry,<sup>6</sup> established between 2002 and 2013, according to which femoral access was used in 71.6% of cases, yet in line with the recently published Euro4C registry, which reported that the radial approach was applied in 71.8% of RA cases.<sup>7</sup> The switch from femoral to radial access reflects the increasing confidence of a selected (and dedicated) group of operators having experience in the treatment of calcified stenoses and the adoption of the above-mentioned plaque-modification technique.

Januszek et al<sup>5</sup> reported a higher incidence of coronary artery perforation in the radial-access group compared with the femoral-access one. As fairly acknowledged by the authors, the study design did not allow them to collect relevant information that could help to understand this finding. In fact, we have limited or no data on crucial predictors of coronary artery perforation, such as coronary tortuosity, the extent of calcification, the number and size of burrs used, and the ratio of the burr size to the coronary artery diameter. What is more, we do not know whether RA was used as a first-choice or bailout strategy. Nevertheless, the absolute rate of perforations was very low in both groups (1.09% in the radial-access group vs 0.49% in the femoral-access group), even lower than that observed in the Euro4C registry (1.7%). This confirms the safety of contemporary RA both via the femoral and radial routes.

At any rate, the authors highlighted a very important take-home message: large vessels might need large bores and burrs, even if plaque modification is the final objective. This should be kept in mind when embarking on PCI of calcified coronary stenoses. The vessel size and the ratio of burr to artery diameters should be considered particularly when RA is performed ad hoc, after transradial coronary angiography, when there is still time to introduce a sheathless guiding catheter or to switch to the femoral approach.

#### ARTICLE INFORMATION

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