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Transradial access for rotational atherectomy

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Current evidence suggests that transradial access (TRA) for percutaneous coronary intervention (PCI) decreases bleeding and major vascular complications compared to transfemoral access (TFA) [1]. Thus, a steady increase in the adoption of TRA for PCI has been seen worldwide [2]. However, the average radial artery diameter is 3.1 ± 0.6 mm in men and 2.8 ± 0.6 mm in women compared to 6.6 ± 1.2 mm in the common femoral artery [3,4]. Therefore, interventional cardiologists have traditionally been reluctant to use TRA for complex coronary lesions where use of a larger-caliber guide catheter is anticipated [2,5]. One such scenario is rotational atherectomy, which sometimes requires a guide catheter with a larger lumen, particularly for larger burrs (≥1.75 mm) [6].

In this issue, Khan and colleagues report a meta-analysis of observational studies comparing the safety and efficacy of TRA versus TFA for rotational atherectomy [7]. The analysis included 9153 patients from 5 retrospective studies and showed that TRA was associated with a lower risk of access site bleeding and radiation exposure. However, a statistical difference between access sites was not found for the risks of myocardial infarction (MI), stent thrombosis, major adverse cardiac events (MACEs), and mortality. Similarly, hospitalization times, procedure times, and procedural success rates were similar between the two. The guide catheter in TRA was size 6F in the majority of the studies; in one, it was a size 7.5F sheathless guiding catheter [8].

The authors should be congratulated for reporting such an important and timely analysis. However, a critical limitation is that all studies were observational, limiting the internal validity of the analysis due to selection basis and confounding factors. A potential issue with selection bias is suggested by their finding that a lower radiation dose was associated with TRA. This contradicts the findings of the largest meta-analysis of randomized clinical trials comparing TFA with TRA; in which TRA was associated with significant increase in radiation exposure in both diagnostic and interventional procedures compared with TFA [9]. Therefore, it is possible that patients with more complex diseases underwent TFA when physicians anticipated the need for repeated rotational atherectomies using stepped-up burr sizes [6].

Over the last decade, with improvements in devices and techniques, including the introduction of thin-walled hydrophilic sheaths (Glidesheath) and the sheathless approach, increasingly complex interventions have been performed using TRA [5,8,10]. Consistent with this meta-analysis and other studies, the European expert consensus on rotational atherectomy suggests that a majority of calcified lesions can be modified using a 1.25- or 1.5-mm atherectomy burr with a 6F guiding catheter via TRA [5–7]. This approach seems not only efficacious, but also safe in that it decreases the risk of major vascular complications. In rare cases, when a larger burr is needed, a 7F or even a 7.5F guiding catheter can be used via TRA with a Glidesheath or the sheathless approach [6,8,10]. It seems that with improvements in technology, more interventionists are becoming comfortable with rotational atherectomy via TRA [5]. A recent report from the British Cardiovascular Intervention Society (BCIS) PCI database showed that use of TRA for rotational atherectomy increased from 19.6% in 2007 to 58.6% in 2014 [5]. This retrospective study, including 11,444 cases, is the largest study in the field, but was not included in the meta-analysis by Khan and colleagues. In this BCIS study, procedure success rate, MACE rate, and all-cause mortality were similar between the two access sites, but the risks of major bleeding and vascular bleeding were lower with TRA, as reported in the current meta-analysis. In contrast to the current meta-analysis, however, TRA was associated with a reduction in hospitalization time and greater rates of same-day discharge in the BCIS report. Furthermore, contrary to prevailing wisdom, high-risk patients (i.e., elderly and female patients) who may benefit most from TRA are less likely to undergo rotational atherectomy via TRA. These data suggest that despite improvements in the adoption of TRA for rotational atherectomy, there is still room for additional improvements.

In summary, the current expert consensus on rotational atherectomy is that this technology should be used as a plaque modifier rather than a debulking tool [6]. Therefore, routine use of smaller-caliber guide catheters for TRA does not necessarily represent a limitation since in the large majority of cases plaque modification can be achieved using a 1.25- or 1.5-mm burr. However, high-quality robust evidence from randomized clinical trials looking at the optimal vascular access is not available for rotational atherectomy. Nevertheless, current best available evidence based on observational studies seems to suggest that rotational atherectomy via TRA is feasible, as efficacious as TFA, but safer, and potentially cost-effective compared to the TFA.

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