

Should We Abandon Femoral Access for STEMI?

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Although I would be considered a “radialist,” I can understand why not all interventional cardiologists embrace this vascular approach. I happened to find the challenges in overcoming the learning curve of this approach to be gratifying once overcome, whereas others perceive them merely as a nuisance. Although we radialists rarely acknowledge it, we do make some sacrifices, or at least accommodations, in order to perform our procedures via this pathway. For example, we may not have the ability to use larger catheter sizes. In fact, sometimes even 6 Fr catheters can be associated with pain or difficulty with catheter movement. Arteriosus lusingium is only a meaningful issue if the arm approach is used. There can be subtle challenges, such as the stable placement of the back end of the guiding catheter outside the body. This does not preclude doing the case radially, but can make things a bit more inconvenient. Since there can be several disincentives to the radial artery approach, it is understandable that many remain unconvinced that the hassles are truly worthwhile. So what are the implications that two trials suggested a mortality benefit when the radial approach was used to access the arterial system during an ST-elevation myocardial infarction (STEMI)?

Although the overall finding of the RIVAL trial of radial versus femoral approach for percutaneous coronary intervention in patients presenting with either STEMI or non-ST elevation myocardial infarction (NSTEMI) was negative, the most striking finding was a statistically significant 59% mortality benefit favoring the radial approach in the group with STEMI. Strikingly similarly, the RIFLE-STEACS trial also showed a 43% mortality benefit in patients undergoing percutaneous coronary intervention (PCI) via the radial versus the femoral route. Even though this was also a subgroup, in this case it is consistent with the primary endpoint of the trial, which demonstrated a significant reduction in

the combined endpoint of cardiac death, myocardial infarction, stroke, target lesion revascularization, and non-coronary artery bypass graft bleeding at 30 days in patients presenting with STEMI randomly assigned to radial versus femoral intervention. Interestingly, of these components, only cardiac death was significantly reduced, reminiscent of the specific mortality reduction in RIVAL. Are these sufficient data to recommend the radial approach for all patients undergoing primary PCI for STEMI?

Although a similar, statistically significant finding was made in two separate studies, there are reasons why the data cannot be embraced as absolute. First, the finding of benefit of radial artery access in STEMI patients in RIVAL, intriguing though it may be, is a subgroup analysis of a negative trial. RIFLE-STEACS did meet its primary endpoint, but the study was not powered to look specifically at mortality and it has been observed that the mortality in the femoral arm was unusually high, suggesting that the findings may not have been exclusively due to a benefit of the radial artery approach.

More recently, the STEMI-RADIAL trial, a four-center study from the Czech Republic, demonstrated a significant 80% reduction in severe bleeding and vascular complications. The study was not powered for mortality, but did show a nonsignificant 26% reduction in 30-day mortality.

The findings of these studies strongly argue that there is a justifiable need for a randomized trial in STEMI patients comparing radial and femoral artery access, powered for mortality. Ideally, the study will be designed to ensure that the most optimal femoral artery approach is used. Thus, contributing centers should have operators with experience in STEMI patients using both access sites. More sophisticated access techniques should be considered to optimize safety. For example, ultrasound guidance simplifies not only radial artery access, but femoral artery access as well. Because the femoral artery is

so large compared to the radial, it is standard for most operators to puncture the femoral artery using landmarks and tactile information, and is easier than puncturing the radial artery. However, with ultrasound, one can have visual confirmation where the needle is puncturing the vessel. This knowledge can help in avoiding areas of plaque, especially calcified plaque, as well as ensuring the puncture is not at the bifurcation of the femoral artery, and quite possibly reduces the likelihood of inadvertent venous puncture.

All of this is a preamble to the question of what happens to the interventional cardiology landscape if such a trial confirms a mortality benefit for patients undergoing primary PCI for STEMI. This would invariably make it a class I guideline recommendation to use radial artery access (when feasible) for patients presenting with STEMI. This would require all interventional cardiologists and cath labs who treat STEMI patients to become not only experienced, but facile in radial artery access for PCI. Although several studies have suggested that door-to-balloon time is not affected by vascular access choice, those studies have predominantly been done using operators with extensive radial artery access experience. In order for operators to become proficient in radial artery approach for STEMI, a significant number of the non-STEMI cases will need to be done via radial access. There will have to be a major shift in training programs as well, to ensure that those in training develop appropriate experience in the more challenging use of the radial artery for access. Thus, such a study could be disruptive toward the practice of invasive and interventional cardiology, leading to a wholesale shift from the femoral approach to the radial artery approach for coronary artery procedures. Given that currently only a minority of coronary cases are done via radial artery access, at least in the United States, this could have a major impact on how interventional cardiologists practice their craft.

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