Transradial Coronary Interventions: Another Pathway to the Heart

Kung-Wei Lee
Section of Cardiology, Department of Internal Medicine, Changhua Christian Hospital, Changhua, Taiwan

Currently, the transradial approach to cardiac catheterization and coronary interventions has progressively gained popularity as a method of access since its first introduction by Campeau in 1989 for diagnostic coronary angiography. More recently, transradial coronary angioplasty (PTCA) and stenting using 6-Fr guiding catheters have been performed with high success rates and a low risk of vascular complication, initially by Kiemeneij and Laarman. Although, the radial access site of catheterization is not new (the approach dates back to the 1940s), it has only in the last few years become more widespread, not only in Europe but in America and Asia.

Technological advances coalesced in the late 1980s, allowing a new generation of cardiologists to reevaluate the radial approach. However, why bother to replace the femoral artery approach? The femoral approach is the dominant technique and easy to learn, offering a high rate of success in obtaining coronary angiograms and performing interventions. The problems with the femoral artery approach include vascular complications, initially because of the prolonged period of groin compression and later because of immobilization. The primary barrier to acceptance of the radial technique by interventional cardiologists has been the learning curve. Moreover, in the methods section of some trials, which reported the number of previous procedures performed via the radial artery, it is evident that trials conducted by experienced operators (e.g. more than 1,000 procedures) showed much lower failure rates than trials in which operators had only limited previous experience in transradial coronary angiography or intervention. (procedure failure in radial vs. femoral approach: odds ratio 22.51, 95% CI 3.01 to 168.42 in ACCESS trial with 7% 21/300 patients vs. OR 1.52, 95% CI 0.06 to 37.70 in CARAFE study with 0.7% 1/140 patients).

Transradial approach exhibited a higher number of procedural failures in the early and pioneering trials of the 1990s, such failures were far less common in later studies. Actually, there are several reasons underlying a procedural failure. First, inability to successfully puncture the radial artery. Second, failure to reach the coronary ostia. Third, an inadequate catheter support. In this issue of the journal, Huang et al. prospectively study analyzed 346 patients who underwent coronary angiography or angioplasty, of whom 17 (4.9%) patients had procedural failure (10 patients puncture failure and 7 patients fail to reach coronary), 10 (3%) patients had entry site complications. Indeed, one of the major pitfalls of transradial access is radial artery occlusion due to thrombosis. Its incidence ranged from 3% to 6% in the studies that performed a Doppler ultrasound examination of radial artery after the procedure, whereas a loss of radial pulse was present in 0% to 9% of patients in the other trials. No clinical squeals were signaled after occlusion of the radial artery in these patients. In contrast, Huang et al. study had significantly inferior than the other trials (Hung’s: 3% vs. the other trials: 0.3%).

Indeed, transradial catheterization has undergone rapid changes during the last decade as technological advances have allowed procedures to be done that before could only be accomplished through larger equipment placed in the femoral artery. Although the transradial technique is rapidly being refined, there are some common elements to the technique that are applicable to most approaches through the radial artery. However, for the transradial approach, a very interesting trend has occurred because of an evident improvement of all the materials (new hydrophilic sheaths, different kinds of pharmacologic cocktails, novel guiding catheters) to reduce the incidence of radial artery spasm and to simplify the engagement of coronary artery. Another issue is regarding the utilization of devices requiring catheters with a larger inner diameter (7-Fr to 8-Fr or more). Further improvements associated with increased operators...
skills may lead to the utilization of transradial access in always more challenging situations without significant harm to patients. The remaining problems for the transradial approach are to overcome radial artery spasm and to improve operators skills, not only the radial artery diameter itself. For transradial access to become the mainstay approach for catheterization and percutaneous coronary interventions, continued medical research and large-scale trials of evidence-based medicine will be needed.

REFERENCES