Transradial Approach for Coronary Angiography and Angioplasty in Taiwanese Population

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The percutaneous transradial approach for cardiac catheterization has been shown to be a safe alternative to the femoral artery approach, owing to the favorable anatomical relation of the radial artery to surrounding structures and the dual blood supply to the hand. With the miniaturization of coronary interventional equipment, Kiemeneij and Laarmen\textsuperscript{1,2} have advocated the technique as an alternative approach for coronary intervention, citing reduced femoral vascular complications, early ambulation and shorter hospital stay.

In general, body size and radial artery size in Asian people are thought to be smaller than those of European people. Wu et al.\textsuperscript{3} reported that transradial catheterization for diagnostic coronary angiography and balloon angioplasty might be a safe and practical alternative approach in Chinese patients. There were slightly more patients with pulse deficit observed in their study (12% vs. 6%) compared with the report by Campeau et al.\textsuperscript{4} This may be accounted for by the relatively smaller size of the radial artery in Chinese patients, which leads us to inquire as to whether the radial artery occlusion rate in Chinese patients is higher than in the Western population. In this issue of the journal, Huang et al.\textsuperscript{5} report the rates of immediate occlusion were 4.7% by radial pulse method and 10.7% by Doppler study. There was a 72.2% spontaneous recanalization rate at 3 months after the procedure, and only 3% of the patients had subsequent chronic radial artery occlusion. This result is similar to the findings of Stella et al.\textsuperscript{6} from Amsterdam, The Netherlands. There are important differences between the radial pulse method and Doppler study. Palpation of the puncture site may give false-positive pulses in the case of radial artery occlusion due to the formation of collaterals or to palpation proximal to the original puncture site. False-positive radial artery pulses can also be produced by retrograde ulnar artery flow through the palmar arch distal to the occlusion. In this report, the authors found that a small radial artery, a larger sheath and RAID/SOD $< 1$ and a smaller flow volume were associated with more frequent radial artery occlusion. Choosing smaller-sized guiding catheters (such as 5- or 6-French) for simple interventional procedures may help to reduce the risk of radial artery occlusion. Other important factors in the prevention of occlusion may include shorter duration of cannulation and immediate post-procedural sheath removal while patients are still under heparinization. Lefevre et al.\textsuperscript{7} found a significant reduction of radial occlusion after administering 5,000 IU of heparin during the procedure in comparison with 1,000 IU doses previously administered, which suggests that a more forceful anticoagulation regimen will result in a lower incidence of radial artery occlusion.

In primary and rescue percutaneous coronary intervention, the risk of access site complication is an important issue because of the use of thrombolytic drugs, antiplatelets and glycoprotein IIb/IIIa inhibitors. Ziakas et al.\textsuperscript{8} compared the radial and the femoral approaches in percutaneous coronary intervention for acute myocardial infarction. They found that in-hospital major adverse cardiac events (death, target-vessel revascularization and repeat acute myocardial infarction) were similar in both groups. One of the major concerns regarding the use of the transradial approach in the setting of acute myocardial infarction is the possible delay in achieving reperfusion. There was no difference by skilled operators in Ziakas paper.\textsuperscript{8} Vascular access complications were significantly higher in the femoral group ($p < 0.01$). Major vascular complications (need for transfusion or surgical repair, decrease in hemoglobin $> 3$ mg/dL) occurred only in the femoral group (1.5%). The femoral group also had significantly greater hematomas (12% vs 1% in the radial group, $p < 0.01$). Recently, several new closure devices have been introduced for procedures performed via femoral artery access, such as the Angio-Seal, Vaso-Seal and

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Periclose, but their vascular complication rates are still 2.3%-3.2%.\(^9\) The major vascular complications were significantly higher using the femoral approach, even when a closure device was used. The closure device also increases the cost of interventional procedures.

Because restenosis of the coronary artery after intervention still occurs, the outcome of repeated transradial procedures are not discussed in this study. Yoo et al.\(^{10}\) have evaluated the changes in radial arterial diameter and the outcome of repeated transradial procedures through the same radial artery in 117 cases. The mean radial arterial diameter was significantly decreased, from 2.63 ± 0.35 to 2.51 ± 0.29 mm, during follow-up after the initial procedure. There was no significant difference in the vascular access times and procedural success. However, 2.6% of the patients developed radial arterial occlusion in the repeated-use group, which was higher than the initial-use group. We believe that repeated use of the same radial artery is nevertheless effective, considering its high procedural success and low complication rate in the majority of patients.

The use of the transradial access technique has become popular at many centers in Europe, Canada, the United States and Asia. Although there is a steep initial learning curve with transradial catheterization,\(^{11}\) once cardiologists are comfortable with this procedure in elective settings, they can begin to use the technique in many percutaneous coronary interventional procedures, including acute myocardial infarction. Given the potential benefits associated with transradial cardiac catheterization, it is a technique with which current and future interventional cardiologists should gain increased familiarity and comfort.

REFERENCES