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Editorial

The Transradial Approach for Coronary Intervention: More Comfort, Better Outcome

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▸ See the article "A Comparison of Transradial and Transfemoral Percutaneous Coronary Intervention in Chinese Women Based on a Propensity Score Analysis" in volume 48 on page 719.

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Percutaneous coronary intervention (PCI) has been the mainstay of revascularization for patients with significant coronary artery disease. Traditionally, the femoral artery has been the preferred access site for PCI because of its larger size, easy access, and use of large-sized catheters. However, the femoral approach confers a greater risk of access site vascular complications, including hematomas, retroperitoneal hemorrhage, pseudoaneurysm, and arteriovenous fistulas. Femoral access site complications were initially reported in up to 10% of cases[1)2)] and remain an important clinical issue. The transradial approach was first introduced by Compeau[1)] in 1989 for coronary angiography. It continued to evolve in application, and is now commonly used for PCI because it allows early ambulation and earlier discharge, and has a lower risk of morbidity and mortality. With advances in devices and techniques, transradial PCI is increasingly being adopted in real-world clinical practice. However, as the size of the radial artery is relatively smaller in Asians than in Westerners, Asian patients have a higher risk of radial artery injury and local complications.[3-5)] Furthermore, the radial approach is technically more difficult in women than in men because of their smaller-caliber radial artery and higher risk of radial artery spasm. In this issue of the *Korean Circulation Journal*,[6)] the investigators compared the safety and efficacy of transradial and transfemoral PCI in Chinese women. In 899 propensity score-matched patients, transradial PCI was associated with reduced major post-PCI bleeding (odds ratio [OR], 0.64; 95% confidence interval [CI], 0.54–0.76; p<0.001) and access site complications (OR, 0.67; 95% CI, 0.61–0.74; p<0.001). The incidence of major adverse cardiac events was similar between the 2 groups. These findings show the advantage of transradial PCI over transfemoral PCI in Asian women, demonstrating that PCI can be safely performed through a transradial approach even in Asian women.

A number of studies have demonstrated the superiority of transradial over transfemoral access for PCI with regard to both access site complications and clinical outcomes, leading to an exponential increase in the adoption of the transradial approach.[7-10)] In the RadIal Versus femorAL access for coronary intervention (RIVAL) trial, 3,507 patients with acute coronary syndrome who were undergoing coronary angiography with possible intervention were randomized to either the radial or femoral approach.[8)] There was no difference in primary outcome (composite of death, myocardial infarction, stroke, or non-coronary artery

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bypass graft-related major bleeding) at 30 days. However, there was a significant interaction for the primary outcome favoring the radial approach in the highest tertile volume radial centers (hazard ratio [HR], 0.49; 95% CI, 0.28–0.87; p=0.015) and in patients with ST-segment elevation myocardial infarction (HR, 0.60; 95% CI, 0.38–0.94; p=0.026). The incidence of local vascular complications was significantly lower in the radial group than in the femoral group. In the Radial Versus Femoral Randomized Investigation in ST-Elevation Acute Coronary Syndrome (RIFLE-STEACS) trial, 1,001 patients with ST-segment elevation myocardial infarction undergoing primary PCI were randomized to the radial or femoral approach.[9] The primary outcome (composite of cardiac death, stroke, myocardial infarction, target lesion revascularization, and bleeding) at 30 days was significantly lower in the radial group than in the femoral group (13.6% vs. 21.0%, p=0.003). In addition, the radial (vs. femoral) approach was associated with significantly lower rates of cardiac mortality, bleeding, and shorter hospital stay. In the Minimizing Adverse Haemorrhagic Events by TRansradial Access Site and Systemic Implementation of angioX (MATRIX Access) trial, 8,404 patients with acute coronary syndrome who were undergoing coronary angiography and PCI were randomized to either the transradial or the transfemoral approach.[10] The net adverse clinical events (composite of all-cause mortality, myocardial infarction, stroke, or Bleeding Academic Research Consortium [BARC] type 3 or 5 bleeding) were lower in the radial group than in the femoral group (relative risk [RR], 0.83; 95% CI, 0.73–0.96; p=0.0092). The difference was driven by BARC major bleeding unrelated to coronary artery bypass graft surgery (RR, 0.67; 95% CI, 0.49–0.92; p=0.013) and all-cause mortality (RR, 0.72; 95% CI, 0.53–0.99; p=0.045). These findings show that in patients with acute coronary syndrome undergoing invasive procedures, the radial (as compared with the femoral) approach reduces the net adverse clinical events through a reduction in major bleeding and all-cause mortality. Taken together, randomized controlled clinical trials confirmed that the radial approach reduces bleeding and vascular complications after PCI compared with the femoral approach, especially in patients with acute coronary syndrome. The radial approach should be considered the preferred method for PCI in this clinical setting.

Finally, there is no doubt that transradial PCI has more significant clinical benefits than transfemoral PCI. However, this approach requires a longer learning curve for the operator and also limits the use of certain devices, such as temporary pacemakers, left ventricular assist devices, and larger devices for PCI. In addition, transradial PCI is difficult to perform in patients with abnormal radial artery anatomy, small radial artery, or tortuous subclavian artery. In these special situations, tranfemoral PCI might be more appropriate. In summary, both radial and femoral approaches seem to be safe and effective for PCI. However, the radial approach is associated with a lower risk of local vascular complications.

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