



Clinical Corner

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TRANSRADIAL CARDIAC CATHERIZATION

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Cardiac catheterization is a basic tool for cardiologists in the management of patients with coronary artery disease. Over the past two decades, refinements in the technique of coronary angioplasty and stenting have resulted in the procedure becoming an important option in the treatment of these patients. The procedure traditionally has been done from the femoral artery, the large artery to the leg. While access is much simpler and easier using this artery, hemostasis or stopping the bleeding after the catheter removal may be problematic. This is particularly true in more complex cases in which intensive anticoagulation is required for procedural success.

While the incidence of these bleeding complications has decreased significantly in the past ten years, it continues to occur in 3-5% of patients in whom catheterization is performed from femoral access. A variety of femoral artery closure devices have been evaluated; but these have not eliminated the problem, particularly after percutaneous coronary interventional procedures (PCI). More importantly, recent data has demonstrated that these bleeding complications are associated with a mortality risk. Indeed, long term survival in patients with PCI-related bleeding is significantly reduced when compared to those without bleeding.

Approximately 15 years ago, the concept of using the radial artery as an access site for catheterization procedures was proposed by Dr. Ferdinand Kiemeneij in Amsterdam. The artery is superficial, lying over the radius bone in the forearm. It is thus easily compressible and hemostasis is simple with a very low risk of bleeding.

Multiple studies have now demonstrated access site bleeding complications are virtually eliminated by using the transradial approach. Several hemostasis devices which selectively compress the radial artery while maintaining flow in the ulnar artery are currently available (Figure 1).

Another huge advantage of the transradial approach is that patients are freely ambulatory after the procedure. Because of the risk of bleeding associated with femoral procedures, patients must lie flat in bed for up to six hours with the associated morbidity of back pain and bedpans.

Patients are encouraged to sit up, walk around, and use the bathroom after transradial procedures and thus overwhelmingly prefer the arm approach. Nurses also prefer this technique since patients are more self-sufficient.

As a result of these benefits, transradial procedures are now performed worldwide in large numbers of patients. The adoption of the technique in the United States has been slower because the procedure has not generally been taught at teaching centers. There is a definite learning curve for cardiologists who were only taught the femoral technique. However, there are now numerous seminars at national meetings and transradial centers in the U.S., and most can learn the technique in fewer than 50 cases. With the recent demonstration that PCI-associated mortality can be reduced with radial access, there is a definite groundswell of support for its use.

A disadvantage of the transradial approach is that this artery is not as large as the femoral artery, and relatively small catheters must be used. However, there has been a consistent miniaturization of coronary stent

devices over the past decade and virtually all contemporary procedures can now be performed from the wrist. Also due to its small size, insertion of catheters may take longer, and there has been a reluctance to use this access in patients with acute coronary syndromes undergoing emergency procedures. However, these patients are intensively anticoagulated and have an increased risk of bleeding complications; thus, they present a compelling indication for radial access. With experience, transradial access can be obtained expeditiously and it should become the default strategy in these patients.

Reducing the cost of medical care today is a necessity and there are several opportunities with transradial access. Simply eliminating bleeding complications alone will reduce hospital costs substantially. Patients require less nursing care after radial procedures and there is increased efficiency in the catheterization laboratory holding area. Several studies in the past decade have now demonstrated that the risk of coronary stent procedures has become so low when performed from the radial approach that selected procedures can safely be done as an outpatient.

The transradial approach is now accepted worldwide as an alternative access for coronary interventional procedures. It is anticipated it will be increasingly utilized in the future. §



Figure 1. Radial artery hemostasis device.