EDITORIAL COMMENT

Transradial Access

Just Do It!*  

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Femoral access bleeding complications remain an important cause of morbidity and mortality in patients undergoing percutaneous coronary interventions (PCI). With the expansion of the use of these procedures for more complex and acute coronary syndromes, complications are persistent, and interventionalists have refocused on this issue (1,2). Femoral closure devices have had an impact, particularly when used in experienced hands, but have not solved the problem.

Multiple studies have demonstrated that bleeding complications after PCI can be substantially reduced with transradial access. Furthermore, transradial primary success rates, even in high-risk groups, are similar to those from the femoral approach (3,4). However, the penetration of this approach in the U.S. remains quite low (5). This is largely due to lack of widespread training in fellowship and subsequent trepidation involving the learning curve.

Dehghani et al. (6), in this issue of JACC: Cardiovascular Interventions, present a trial that will hopefully encourage interventionalists to try this alternative access. This study presents the results of a group of “low-to-intermediate” volume operators using the transradial approach for interventions over a 4-year period. A total of 2,100 patients (38% of total volume) underwent transradial PCI. The primary success was 95% with a 1% complication rate. This was accomplished with traditional transfemoral 6-F guide catheters.

Comprehensive analysis of their data revealed advanced age, prior coronary bypass surgery, and short stature were independent predictors of transradial failure. The mechanisms of failure were inadequate arterial puncture (13%), failure to advance catheter to ascending aorta (51%), and poor guide catheter support (34%). All of the transradial failures were subsequently completed from the femoral approach during the same procedure.

Although the incidence of failure was only 5% in this study, operators elected not to use radial access in 62% of patients. Only 17% of the patients were female. The authors provide useful information regarding appropriate patient selection, but the percentage of patients that are candidates for transradial access in a given population should be substantially higher.

There are a few “tricks” that seasoned “radialists” employ to increase the percentage of patients that have successful transradial procedures:

1. Radial artery access with a 21-gauge needle with a 0.018-inch guidewire is easier than with the 20-gauge needle and 0.025-inch guidewire used in the present study.
2. Spasm should not be a limiting factor in radial procedures. Intra-arterial verapamil in 3- to 5-mg increments can be repeated, because hemodynamic effects are usually minimal. Nitroglycerin may also be given but has more of a hypotensive effect. Furthermore, adequate sedation before the procedure will minimize circulating catecholamine-induced vasospasm.
3. Increased right subclavian tortuosity due to unwinding of the aorta is a common cause of transradial difficulty in elderly patients. Having the patient take a deep breath straightens this tortuosity and facilitates passing the guidewire to the ascending aorta. An angled hydrophilic guidewire rather than a standard J is useful in this situation.
4. Specific transradial guide catheters are available. A common characteristic of these catheters is a secondary curve that uses the contralateral aortic wall for support. Back-up is thus usually better than that obtained with traditional femoral guides.
5. The 5-F guide catheters are suitable in many cases of straightforward PCI, particularly in women. Transradial curves might be necessary with these smaller guide catheters.
6. Left radial artery access is a useful option. The high anterior takeoff of left coronary saphenous vein grafts is difficult to cannulate from the right radial and are best accessed from the left radial approach. It is the preferred approach for left internal artery graft PCI.

Short stature has not previously been reported as an independent predictor of transradial failure. One could postulate that the reasons might be more right subclavian tortuosity in these patients as well as difficult catheter maneuverability in a shorter ascending aorta. The left radial approach likely would be useful in these patients.

Radial artery occlusion is a potential complication of transradial procedures not mentioned in the present study. Because it is virtually always asymptomatic, it must be evaluated by either plethysmography or Doppler ultrasound for detection. Its occurrence is probably more common than previously recognized, but it can usually be prevented with
compulsive hemostasis techniques after sheath removal (7). Although hand ischemia is rare because of the dual blood supply to the hand, the artery is lost for future procedures.

Cost containment of interventional procedures is an essential contemporary endeavor, and a reduction in the frequency of access complications would have a major impact (8,9). In addition, staff requirements after transradial procedures are less due to safer hemostasis and earlier ambulation. Selected patients may be safely discharged the same day after PCI, and the Society for Cardiovascular Angiography and Interventions recently issued an expert consensus document (10).

Success with transradial access in elective cases results in experience that can be used in acute cases, including ST-segment elevation myocardial infarction (STEMI). The STEMI patients are the most intensively anticoagulated and have the highest risk of bleeding complications when primary PCI is performed from femoral access. In fact, 2% to 4% of these patients require transfusion or access site surgery, and additional patients with less severe bleeding events have prolongation of hospital stay. Several single-center studies have confirmed a significant benefit of the transradial approach in STEMI patients with no increase in door-to-balloon times (11–14). A U.S. multicenter prospective trial comparing radial versus femoral access in patients with STEMI is planned (C. Pyne, personal communication, August 2009).

Finally, the authors should be commended on the comprehensive evaluation of their radial experience in elective cases as well as the excellent primary success rate. Hopefully, this information will be useful in relieving the trepidation that is present, particularly in the U.S., in adapting radial access in interventional programs. Interventionalists must overcome inertia . . . and “just do it.”

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