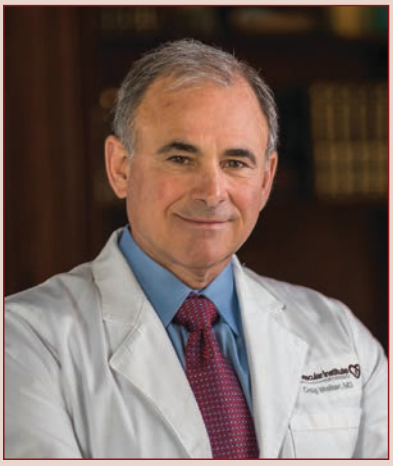
A Retrospective Cohort Study to Evaluate the Efficacy, Safety, and Cost of Minimal Arterial Access Lower Extremity Intervention via Transradial vs Transfemoral Peripheral Revascularizations



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Hello and welcome to the October 2021 edition of *Vascular Disease Management*. This issue has multiple articles of interest. I have chosen to comment on Dr. Imraan Ansaarie and colleagues' article, "A Retrospective Cohort Study to Evaluate the Efficacy, Safety, and Cost of MáLEI via Transradial vs Transfemoral Peripheral Revascularizations."

I have chosen to comment on this article in which a retrospective analysis comparing radial vs femoral arterial access outcomes of a single operator in 90 peripheral vascular interventional cases was evaluated. The patient cohort consisted of relatively equal numbers of male and female patients treated with a radial or femoral arterial approach, who had presented with Rutherford category 3 through 6 symptomatology. The sites of interventional therapy included the infra-renal abdominal aorta, the iliac arteries, and infra-inguinal vessels. The authors acknowledge that radial access was considered the preferred access at their institution but do note that a rigorous screening procedure was utilized to exclude subjects not considered suitable for radial artery access based on vessel size, inadequate ulnar arterial flow, radial or upper extremity obstructive disease, or their ability to reach the target obstructive arterial lesions to be treated with a desired device. A successful procedural outcome (described as a residual stenosis of < 30%) was achieved in all the subjects regardless of the access chosen. There were no data collected on longer-term outcomes in the separate cohorts.

The authors cite several of the limitations of this analysis. This study disclosed that the different access sites were associated with similar procedural times, fluoroscopy times, and rates of success. The only significant reported complication occurred in a single subject in which femoral access was utilized. Using several assumptions, and analyzing only the equipment employed during the procedure, the authors report that there was a substantial reduction of cost in the radial access cohort. There was no direct measurement of radiation exposure of the patient or the cath lab staff.

I have chosen to comment on this report as radial artery access, which has become the predominant access site in coronary angiography and interventions at many institutions, is being utilized increasingly in peripheral arterial interventions. Reasons cited for using radial artery access as a preferred access include less risk of bleeding, patient comfort during recovery, the ability to treat bilateral disease in a single setting, the ability to cannulate downward-sloping aorto-ostial lesions more easily, and less risk of vascular injury, particularly in profoundly obese patients. Patients with prior aortobifemoral bypass, endovascular aortic aneurysm therapy, or kissing iliac stents are often more easily treated with a radial approach.

The availability of longer, low-profile sheaths, guidewires, balloons, orbital atherectomy devices, support catheters, and one self-expanding stent have enabled operators to treat many patients via radial access. Unfortunately, as with any new approach, the treatment options are limited.

There are relatively few guidewires that are long enough to cross and deliver therapies via a radial approach. There are no low-profile balloon expandable drug-eluting stents with delivery systems long enough to be delivered to the proximal infra-popliteal vessels. There are no drug-eluting self-expanding stents with delivery systems that reach the superficial femoral and popliteal arteries from this approach. The delivery systems of specialized, high radial force self-expanding stents are not long enough to routinely reach the intended vessels via a radial approach. Drug-eluting balloons are not available in adequate delivery lengths. Focal force and lithoplasty balloons are not available in radial access lengths. Large diameter balloon expandable stents are not available in long delivery lengths. Radial artery spasm can occur, which may be problematic. Backup catheter support may not be adequate to cross long calcified obstructive lesions and deliver definitive therapies. In prolonged procedures, one must theoretically be cognizant that the sheath is traversing near the ostia of vertebral and carotid arteries with inherent potential for embolic or thrombotic sequelae. Many labs are not ideally suited to easily track the movement of guidewires from the radial to the infra-inguinal arteries. Many operators are not facile with the nuances of radial cannulation, the safe and atraumatic traversing of the vessel, and the ability to direct the initial wire into the descending aorta. Meticulous attention to adequacy of anticoagulation and frequent flushing of these long sheaths, which might otherwise thrombose, is required.

Many operators address these deficiencies by obtaining a secondary arterial access site. This practice, while presently necessary, is certainly not ideal and increases procedural time, cost, and risks of complications.

Despite all the limitations I have cited, the utilization of radial artery access will continue to grow as more devices become available and operators gain skills in radial technique. Hopefully, the FDA will allow companies to adapt presently approved devices to provide longer reach delivery systems to enable interventionists to utilize the full spectrum of devices without cost-prohibitive studies. These adaptations should not require starting from baseline but rather be aimed to ensure that the already approved devices can be successfully delivered. The continued development of lower profile devices will further enable the use of radial access in patients with small arteries and possibly reduce overall risks of thrombotic access site complications.

I sincerely believe that peripheral vascular interventionists must be comfortable with all forms of access to improve technical success, reduce complications, lessen patient discomfort, and reduce costs. Every procedure begins with gaining access and ends with the management of that access site. The choice of vascular access (be it singular or multiple) may be as important as the choice of devices during interventional therapy. At this time, our device choices when utilizing radial access for peripheral arterial interventions are markedly limited, but as with every other form of access utilized, I think more devices will be adapted to allow delivery via radial access. As these devices evolve, radial access will further evolve. ■