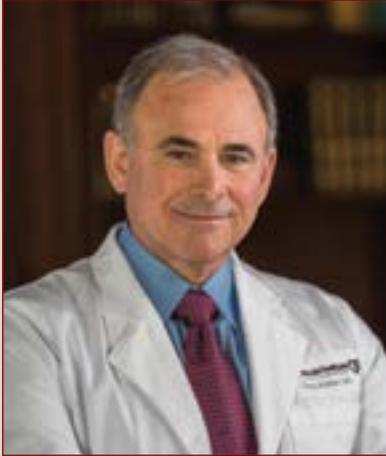


## Taking a Look at the Coming “Radial Revolution”



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**Many interventionists speak of the “Radial Revolution”. Clearly the advantages of radial access are many, and these will increase with continued device improvement, and interventional technique.**

Radial access has many advantages in peripheral vascular intervention. Clearly radial access is associated with less access site bleeding than femoral approach, and this advantage is magnified whenever aggressive anticoagulation is required. In cases of severe aorto-iliac obstructive disease where femoral access may result in arterial obstruction, radial access may be feasible and preferable. In right carotid intervention with type 3 aortic arches, radial access may provide a more stable supportive sheath position with less embolic risk secondary to no need to have aortic arch manipulation. In peripheral arterial intervention, bilateral lower extremity intervention via a single access is feasible. Lower extremity intervention in individuals with kissing iliac stents, prior EVAR, prior aorto-bifemoral bypass, or bilateral common femoral artery occlusions where contralateral access or antegrade access may have greater bleeding risk may be better suited for radial approach. Morbidly obese patients do not pose additional bleeding risk with radial access. Downward sloping vessels such as mesenteric and radial vessels are often more easily cannulated from a superior approach. Patient recovery is more comfortable with patients able to sit in recliners. There has been a proliferation in the development of radial interventional devices including longer, low-profile hydrophilic sheaths, guidewires, support catheters, balloons, stents, and atherectomy devices to facilitate interventional success in radial access procedures.

Radial access has several disadvantages as well. There is potential risk of radial artery occlusion (usually asymptomatic as there is dual arterial supply to the hand), radial artery spasm (typically manageable with patience, calcium channel blockers, and nitroglycerin), and the necessity of traversing arteries providing cerebral circulation with potential of embolic sequelae. Although rare, hand ischemia has been reported. Sheath size is somewhat limited. Not all devices have appropri-

Welcome to the February 2021 edition of *Vascular Disease Management*. There are multiple articles of interest this month. I have chosen to comment on Dr. Osama Shoeib and colleagues’ article **“Transradial Carotid Artery Stenting Complicated With Neck Hematoma, Conservative is a Valid Option!”** I have chosen this article not only because of the management of the small arterial perforation that lead to a neck hematoma but to discuss radial approach in treating carotid and peripheral vascular obstructive disease.

The authors describe a case of right carotid artery stenting in a symptomatic patient with high-grade right internal carotid artery stenosis via the right radial artery. This access was chosen as the patient had advanced aorto-iliac occlusive disease and was deemed a high risk for carotid endarterectomy. The technique of wiring the common carotid into the external carotid artery is described. Following this a 6F sheath was advanced into the right common carotid artery via right radial artery access. The obstructive carotid lesion was then crossed with an embolic filter placed distally. Once the filter was placed, standard PTA, stent placement, post-dilation, and subsequent filter removal, and follow-up angiography were performed as with typical carotid stenting. There was an excellent angiographic result with dramatic luminal gain. Unfortunately, there was a small wire perforation that resulted in a neck hematoma without respiratory compromise. This was managed with gentle neck compression and observation guided by external arterial duplex, avoiding an additional intervention.

Radial access has many advantages in peripheral vascular intervention. Clearly radial access is associated with less access site bleeding than femoral approach, and this advantage is magnified whenever aggressive anticoagulation is required. In cases of severe aorto-iliac obstructive disease where femoral access may result in arterial obstruction, radial access may be feasible and preferable. In right carotid intervention with type 3 aortic arches, radial access may provide a more stable supportive sheath position with less embolic risk secondary to no need to have aortic arch manipulation. In peripheral arterial intervention, bilateral lower extremity intervention via a single access is feasible. Lower extremity intervention in individuals with kissing iliac stents, prior EVAR, prior aorto-bifemoral bypass, or bilateral common femoral artery

ate delivery length. Sheath support may be suboptimal in long, distal calcific occlusions. Distal embolic protection filters are presently not of sufficient length to be utilized in most SFA/popliteal interventions. Most thrombectomy devices are likewise not long enough to be useful via radial approach in femoropopliteal intervention. Drug-coated balloons and drug-eluting stents are not presently available in long delivery lengths.

Radial artery intervention is growing worldwide in coronary, carotid, radial, mesenteric, and peripheral arterial interventions. This is primarily driven by patient preference and lower bleeding risk. It is the most commonly utilized approach in coronary interventions in many institutions. Continued progress in the development of compatible device and sheath development has the potential to make radial artery access safer, more broadly applicable, and more effective across other vascular beds. Peripheral interventionists must learn the nuances of radial artery intervention as the skillset required to succeed and to limit potential complications is different than those employed via femoral artery approach intervention. Complication avoidance requires meticulous attention in the monitoring of hand circulation, prevention of arterial spasm, careful frequent sheath flushing to avoid sheath thrombosis, and aggressive sheath aspiration during sheath removal.

Many interventionists speak of the "Radial Revolution". Clearly the advantages of radial access are many, and these will increase with continued device improvement and interventional technique. Not all cases are appropriate for radial access, but it is clearly already the preferable approach in many cases. Patient preference of radial intervention will also play a role in driving further innovation of radial compatible devices. As with all therapy, cost/benefit will impact the adoption of radial access. I strongly believe that interventionists must be facile with the utilization of all sites of access to improve outcomes and limit complications.