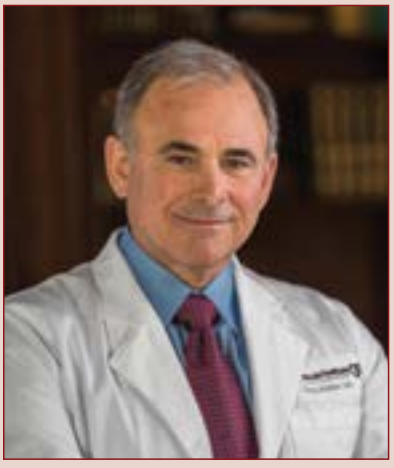
All Providers Must Understand Benefits and Risks of Radial Artery Access



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Hello and welcome to the July 2021 edition of Vascular Disease Management. I have chosen to comment on Dr. Prabha Nini Gupta and colleagues' article "Radial Pseudoaneurysms – Are They Becoming More Prevalent?" I have chosen to comment on this article as radial artery access is being utilized more frequently in coronary and peripheral vascular diagnostic and interventional procedures predominantly to lessen the risk of access-related bleeding complications, and to improve patient comfort during the recovery period. It is imperative that all providers, whether or not they are performing radial artery access, clearly understand the benefits and all of the potential risks associated with radial artery access if we are to choose the best access site in each patient and take measures to prevent known potential complications associated with each access site choice.

In this article, Dr. Gupta and colleagues discuss a case of radial artery pseudoaneurysm presenting with associated pain and a pulsatile forearm three days after failed attempts at obtaining radial artery access (with the coronary stent procedure performed via femoral approach), in an 85-year-old female. The pseudoaneurysm was successfully closed surgically. The authors delineate the differential diagnosis of a radial pseudoaneurysm, the risk factors for the development of pseudoaneurysms, and the potential treatment options. Diagnostic workup is described in detail, and potential preventive measures are discussed. Fortunately, radial artery pseudoaneurysms are much less common than femoral or brachial pseudoaneurysms.

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As radial arteries are smaller than femoral or brachial arteries there is a greater risk of sheaths or catheters being occlusive, and subsequent occlusion of the radial artery post procedure, particularly in prolonged procedures necessitating larger sheaths. If radial artery occlusion occurs and there is insufficient collateral flow to the hand via the ulnar artery, the dreaded complication of critical hand ischemia can occur. Careful assessment of collateral flow, administration of drugs to lessen arterial spasm and clotting, minimization of sheath size, and prior measurement of arterial size by duplex ultrasound can decrease this risk. Some interventionists continually monitor hand arterial saturation with finger sensors during procedures in an effort to detect and potentially avoid hand ischemia when utilizing radial access.

Radial loops or occluded proximal arteries may prevent successful navigation of vessels required to complete procedures or injure vessels. Flexible J-tipped hydrophilic wires are helpful in negotiating radial loops and avoiding unwanted entry into vertebral or carotid arteries. Proximal asymptomatic vascular occlusion should probably mandate utilization of another access site. Wires and catheters should never be advanced against significant resistance.

Radial artery spasm can result in dynamic radial artery occlusion despite the liberal pre-emptive use of vasodilators. Although this typically resolves with patience and liberal administration of more vasodilators, occasionally it does not. There have been case reports of avulsion of the radial artery when sheaths or catheters were removed during profound radial artery spasm.

Radial artery access to perform interventional procedures typically necessitates catheter or sheath placement across cerebrovascular vessels (the vertebral and carotid arteries with right radial access and the vertebral with left radial artery access) with risk of thromboembolism via these vessels. These complications may be lessened by adequate anticoagulation and careful advancement of wires, catheters, and sheaths across these vessels as well as careful slow withdrawal of devices post procedure. Careful monitoring of neurological status is important.

Interventionists begin and end each intervention with vascular access and subsequent management of the access site post procedure. Each potential access site has advantages and disadvantages. It is imperative that we choose access carefully and try to protect against the associated known complications. This is even more important when there is known peripheral vascular disease where access site complications and procedural success may be intimately related to the choice of access. Even when access choice is ideal, we must meticulously execute wire advancement, sheath placement, anticoagulation, vascular spasm avoidance, and if necessary, change access if unexpected issues arise during the procedure. I believe that the choice of access deserves careful consideration in each individual.