Over the past two decades, arterial access via the radial artery has become an increasingly popular technique for coronary interventions. There has been extensive literature citing its safety profile, patient preference, and decreased cost when compared with a femoral access site for coronary interventions. Although femoral access remains the predominant access technique for mesenteric and peripheral interventions, interventional radiologists are increasingly utilizing this technique for non-coronary interventions. In this article, we will discuss the basics of radial artery access.

PREPROCEDURE SET-UP AND TESTING

The first step prior to bringing the patient into the procedure room is to inspect the left wrist and palpate the radial artery. A small amount of lidocaine/prilocaine cream mixed with nitropaste is then applied to the left wrist over the left radial artery to provide local anesthesia as well as to promote vasodilation of the left radial artery. This is then covered with a waterproof transparent dressing. Standard intravenous and medication preparation for the procedure is then performed. The patient is then brought into the interventional radiology suite and positioned supine on the fluoroscopy table with the left wrist supinated on an arm board at the left side. The left arm is positioned flush to the patient’s side, which provides the operator a set-up similar to traditional left femoral access. A rolled sheet can be placed under the wrist to mildly hyperextend the wrist.

A pulse oximeter is then placed on the left thumb for the entirety of the procedure and recovery to allow for continuous monitoring of the left hand perfusion. At this point, a Barbeau test is performed to evaluate the patency of the radiopalmar arch. This is performed by compressing the radial artery for up to 2 minutes and observing the resulting waveform changes. The procedure can be performed in patients with Barbeau classification waveform A, B, or C. For patients who exhibit a type D waveform, which indicates an incomplete palmar arch, a femoral access will be utilized instead. An ultrasound evaluation is performed as well to verify that the radial artery is larger than 2 mm (Figure 1).

PROCEDURE

After testing is complete, the wrist is prepped and draped with a femoral access groin drape. There are specialized radial drapes available. Under ultrasound guidance, lidocaine is injected into the subcutaneous tissues overlying the left radial artery. This is then covered with a waterproof transparent dressing, Standard intravenous and medication preparation for the procedure is then performed. The patient is then brought into the interventional radiology suite and positioned supine on the fluoroscopy table with the left wrist supinated on an arm board at the left side. The left arm is positioned flush to the patient’s side, which provides the operator a set-up similar to traditional left femoral access. A rolled sheet can be placed under the wrist to mildly hyperextend the wrist.

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A variety of catheters can be utilized for transradial procedures. For mesenteric procedures, our preference is a 5 Fr 110 cm Sarah radial catheter (Terumo Interventional Systems). This catheter

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Figure 1. The radial artery is readily identifiable on ultrasound.
has an appropriate shape to traverse the aortic arch into the descending aorta as well as being long enough to reach the superior mesenteric artery and celiac artery in the majority of patients.

A Bentson wire and catheter are advanced through the sheath as a unit and pushed through the brachial artery and into the left subclavian artery. Using fluoroscopy, the catheter and wire are manipulated into the descending aorta. Sometimes a left anterior oblique projection can be helpful to perform this.

Once the catheter is in the abdominal aorta, the catheter is manipulated into the vessel of interest and the procedure is performed as it would be from traditional femoral access.

POST PROCEDURE

At the end of the procedure, the catheter is removed. A hemostasis band is placed on the wrist with the sheath still in place. Our preference is the TR Band (Terumo Interventional Systems). The balloon is inflated with 15 cc of air after being secured firmly over the access point and sheath (Figure 3). The sheath is then removed. The balloon is then deflated slowly 1 cc at a time until there is bleeding at the access site, then 1 cc of blood is replaced into the balloon. This is done to obtain “patent hemostasis” and decrease the risk of radial artery occlusion. Occluding the ulnar artery and confirming there is still a waveform present can also confirm patent hemostasis.

Removal of the band begins after 60 minutes to 90 minutes, depending on the sheath size. Air is removed from the band 1 cc to 2 cc at a time every 30 seconds to 45 seconds, with observation for bleeding at the access site until the band is loose or all of the air is out of the band. If there is bleeding, the initial amount of air is replaced and after 15 minutes of waiting, the process begins again. Once the band is removed, the wrist and access site are examined and the radial artery is palpated to confirm patency.

CONCLUSION

The transradial access techniques outlined in this article have been demonstrated to be both effective and safe for non-coronary interventions, most notably by the recent retrospective study by Posham et al.1 While there is a learning curve to adopting this technique, positioning the left wrist in close proximity to the left groin provides operators with an experience similar to left transfemoral access. Once this learning curve is overcome, there are significant benefits to the technique, such as patient satisfaction, decreased cost, and low complication rate.

REFERENCE