

Optimal Room Setup for Transradial Access

Tips for patient and equipment positioning to allow safe, successful, and efficient TRA-based interventions.

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Transradial access (TRA) has multiple advantages over transfemoral access (TFA) from the patient's perspective. From the operator's standpoint, TRA may provide an opportunity to reduce radiation exposure. The location of access will depend on the patient's left arm position and room setup.

ANATOMIC CONSIDERATIONS AND POSITIONING

Right-arm TRA is typically used if the target treatment area is located on the right side of the neck, head, or chest, or the right arm. For all other TRA interventions, including visceral embolization, interventional oncology, peripheral arterial disease, and neurointerventions on the left side of the neck/head, left TRA is preferred. Access through the left wrist prevents the crossing of the supra-aortic vessels (believed to reduce stroke risk) and provides an additional 4 inches of catheter length during subdiaphragmatic interventions because the right subclavian/brachiocephalic segment is longer in comparison to the left subclavian.

The three most common left arm positions during TRA are: (1) the left wrist tucked against the left side of the torso (the most common position used by cardiologists); (2) the left arm positioned in 45° to 90° abduction; and (3) the left arm crossed toward the right side of the pelvis with the left wrist positioned close to the right groin (wherein the operator works in a position similar to right femoral access approach). The third position has been advocated by some who utilize the “snuffbox” technique.

Use of the position where the patient's left arm is tucked against the torso has been associated with higher radiation exposure.^{1,2} Left arm abduction with a shield placed between the operator and the radiation source is associated with a threefold reduction in radiation exposure.³ We conducted a prospective randomized clinical trial comparing TRA versus TFA in liver embolization procedures. Our findings demonstrated a median operator radiation exposure of 5.5 mrem (1–43 mrem) in TRA



Figure 1. A “door-shaped” shield on wheels offers excellent radiation protection as the operator works totally behind the shield.



Figure 2. The combination of a table skirt and a mobile roof-mounted shield can be also effective to reduce radiation exposure. Reprinted with permission from Shivank Bhatia, MD, and Interventional News. Originally published September 2018.

versus 13 mrem (1–121 mrem) in TFA ($P = .01$).³ The key factors for this significant reduction seem to be the additional distance between the operator and the radiation source and the presence of a large shield, either in a

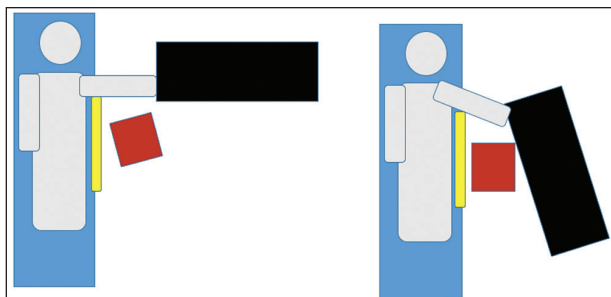


Figure 3. The abducted left arm enables matching of the angiography table to the procedure/patient table (black), creating a large, efficient work surface. A radiation shield (yellow) between the interventionalist and the patient reduces scattered radiation dose to the operator (red).



Figure 4. Typical placement of the screen in older suites.

single piece (Figure 1) or in a combination of a skirt and a mobile roof-mounted shield (Figure 2).

ACCESSORIES AND IMAGING

TRA supplies are typically longer than those for TFA. Ideally, the accessory table should be placed contiguous with the patient's left hand, perpendicular to the patient table. In small angiography rooms, some creativity may be needed to make this work. The accessory table can be placed almost parallel to the patient's table but still attached to the left hand (Figure 3).

When cone-beam CT is needed, the left arm may be temporarily tucked against the torso when the angiography equipment has a large bore (eg, Discovery IGS 740, GE Healthcare) or for equipment that requires a smaller spin angle to perform rotational angiography (Azurion,

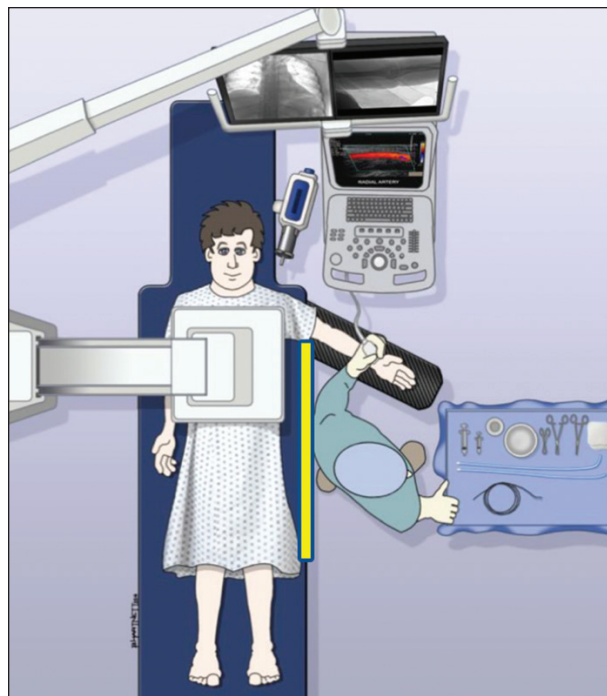


Figure 5. With newer angiography equipment, the operator may look straight to the monitor positioned behind the patient's left shoulder. The top panel is reprinted from Canadian Association of Radiologists Journal, 68/3, Thakor AS, Alshammari MT, Liu DM, et al, Transradial access for interventional radiology: single-centre procedural and clinical outcome analysis, 318–327, Copyright (2017), with permission from Elsevier.

Royal Philips). In other angiography equipment with a small bore, the left arm may be hyperextended and folded toward the patient's head. Depending on the type of angiography suite, there are slight differences on the monitor position during TRA. In older units, the monitor is typically placed to the left and slightly behind the

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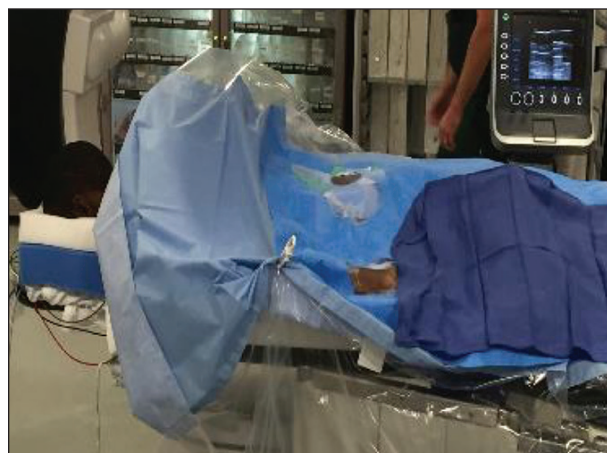


Figure 6. A patient in the “Superman” position (prone position, left arm with the palm upward). This allows simultaneous endovascular TRA and a percutaneous translumbar approach to treat endoleaks and visceral pseudoaneurysms.

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detector (Figure 4). In newer angiography suites, it is usually positioned cranially from the patient’s left arm/shoulder (Figure 5). Different angiography equipment and alternative techniques (Figure 6) may require specific room setup in order to maximize the benefits of TRA.

CONCLUSION

To establish a successful TRA intervention program, we believe it is important to provide specific training for the angiography suite staff to decrease variability and allow effective and safe interventions. ■

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