ASSESSMENT OF COLLATERAL CIRCULATION (MODIFIED ALLEN TEST)

If puncture of the radial artery is planned, a modified Allen test should be performed beforehand when feasible to assess the collateral circulation. Although the anatomy of the radial artery in the forearm and the hand is variable, most patients have adequate collateral flow should radial artery thrombosis occur. The modified Allen test is performed as follows.

Firm occlusive pressure is held on both the radial artery and the ulnar artery (see the first image below). The patient is asked to clench the fist several times until the palmar skin is blanched (see the second image below), then to unclench the fist. Overextension of the hand or wide spreading of the fingers should be avoided, because it may cause false-normal results. The pressure on the ulnar artery is released while occlusion of the radial artery is maintained (see the third image below). The time required for palmar capillary refill is noted.

Image 1.

Modified Allen test: digital occlusion of radial and ulnar artery.

Image 2.

Modified Allen test: clenching of hand.
The modified Allen’s test has been the method most frequently used for clinical assessment of the adequacy of ulnar artery collateral circulation and the patency of the palmar arches of the hand. However, there is some controversial evidence suggesting that it can predict ischemic complications in the setting of radial artery occlusion.
Given the low positive predictive value of the modified Allen test, the examiner should consider further testing to assess patency of circulation, such as finger pulse plethysmography, Doppler flow measurements, and measurement of the arterial systolic pressure of the thumb.\(^1\)

Whether the modified Allen test is clinically reliable as a screening test for adequate collateral circulation of the hand is controversial. A wide range of values for hand reperfusion have been noted, and normal values are not consistent (ranging from 3 to 15 seconds) furthermore, there is conflicting evidence regarding the validity of the modified Allen test as a standard of care.

REFERENCES

Arterial blood gases (woman): radial puncture – WW.16.02