

SPI-US PROTOCOL

Van de Pol D, Maas M, Terpstra A, Pannekoek-Hekman MJC, Kuijer PPFM, Planken RN. B-mode ultrasound assessment of the Posterior Circumflex Humeral Artery - The SPI-US protocol: a technical procedure in 4-steps. Accepted for publication in The Journal of Ultrasound in Medicine. doi:10.7863/ultra.15.05037.

Step 1. The patient is seated next to the operator with the target arm in 60° abduction with the hand resting on the iliac crest.(Figure 1) A high frequency broadband linear array transducer is positioned sagittal oblique in the axillary pit, directed towards the gleno-humeral joint. The axillary artery (AA) and the axillary vein (AV) are identified. The AV is larger than the AA and the AV is compressible, whereas the AA is not. An important landmark is the large caliber TAA, arising from the dorsal side of the AA. (Figure 2)

Step 2. A cross sectional sweep is made from the axillary pit down to the origin of the brachial artery for general anatomical evaluation, localization of side branches and for specific assessment of the PCHA and DBA.

Step 3. The PCHA and DBA are identified. The PCHA origin is located proximal to the DBA origin. The proximal PCHA is characterized by its dorsal origin and curved course running along the dorsal surgical neck of the humeral bone, deflecting from the AA.(Figures 3 and 4) The proximal DBA is also characterized by a dorsal origin and has a straight course running almost parallel to the AA towards the Triceps Brachii muscle. The DBA is the last dorsal branch of the AA in the axillary pit. (Figure 5)

Step 4. The PCHA and DBA diameters are measured at approximately 1 cm distance from the origin. In the event of PCHA dilatation, the maximum diameter of the PCHA is measured. In addition the diameter of the closest normal appearing PCHA vessel segment proximal, or otherwise distal, to the dilated vessel segment is measured. Additionally, the presence of intravascular thrombus and/or vessel occlusion is identified and recorded. Waveform characteristics are obtained to visualize a triphasic or blunted signal. A blunted signal is correlated with a more distal occlusion.



Figure 1

Participants position during the examination



Figure 2

Cross-sectional view at the proximal axillary pit

AA, axillary artery; TAA, thoracoacromial artery

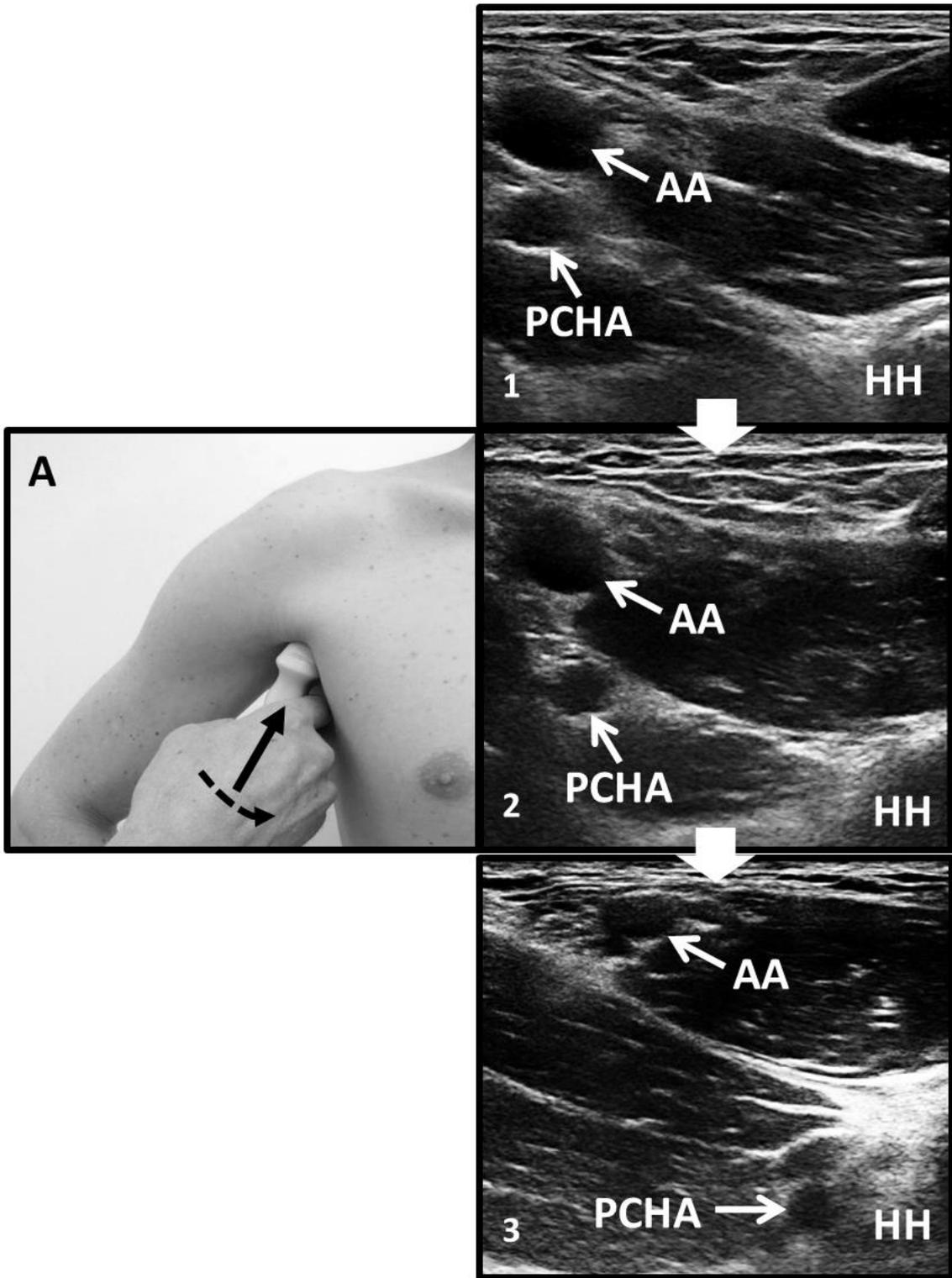


Figure 3

A. Cross-sectional view of the PCHA; 1. At PCHA origin; 2. Half way to surgical neck of the humerus;
3. Along surgical neck of the humerus

AA, axillary artery; PCHA, posterior circumflex humeral artery; HH, humeral head

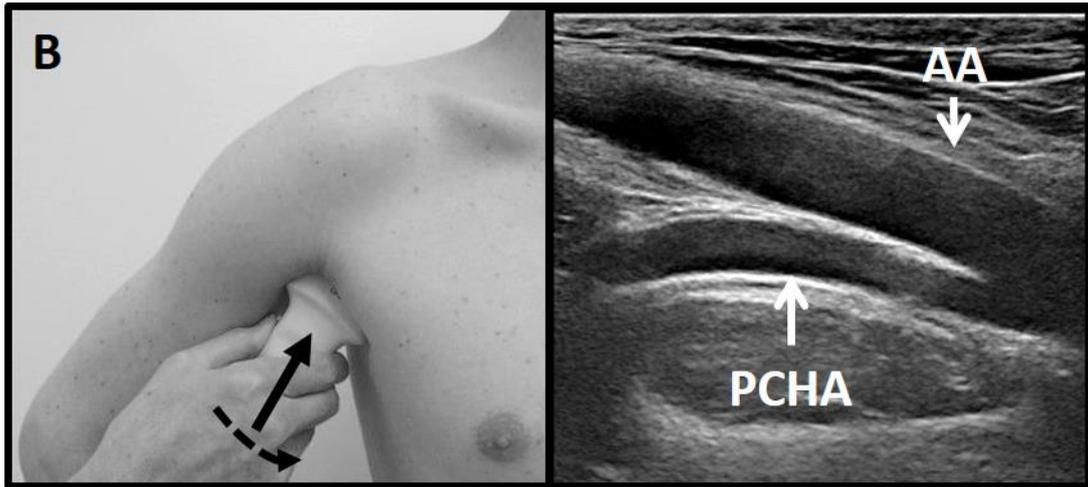


Figure 4

B. Longitudinal view of the PCHA

AA, axillary artery; PCHA, posterior circumflex humeral artery

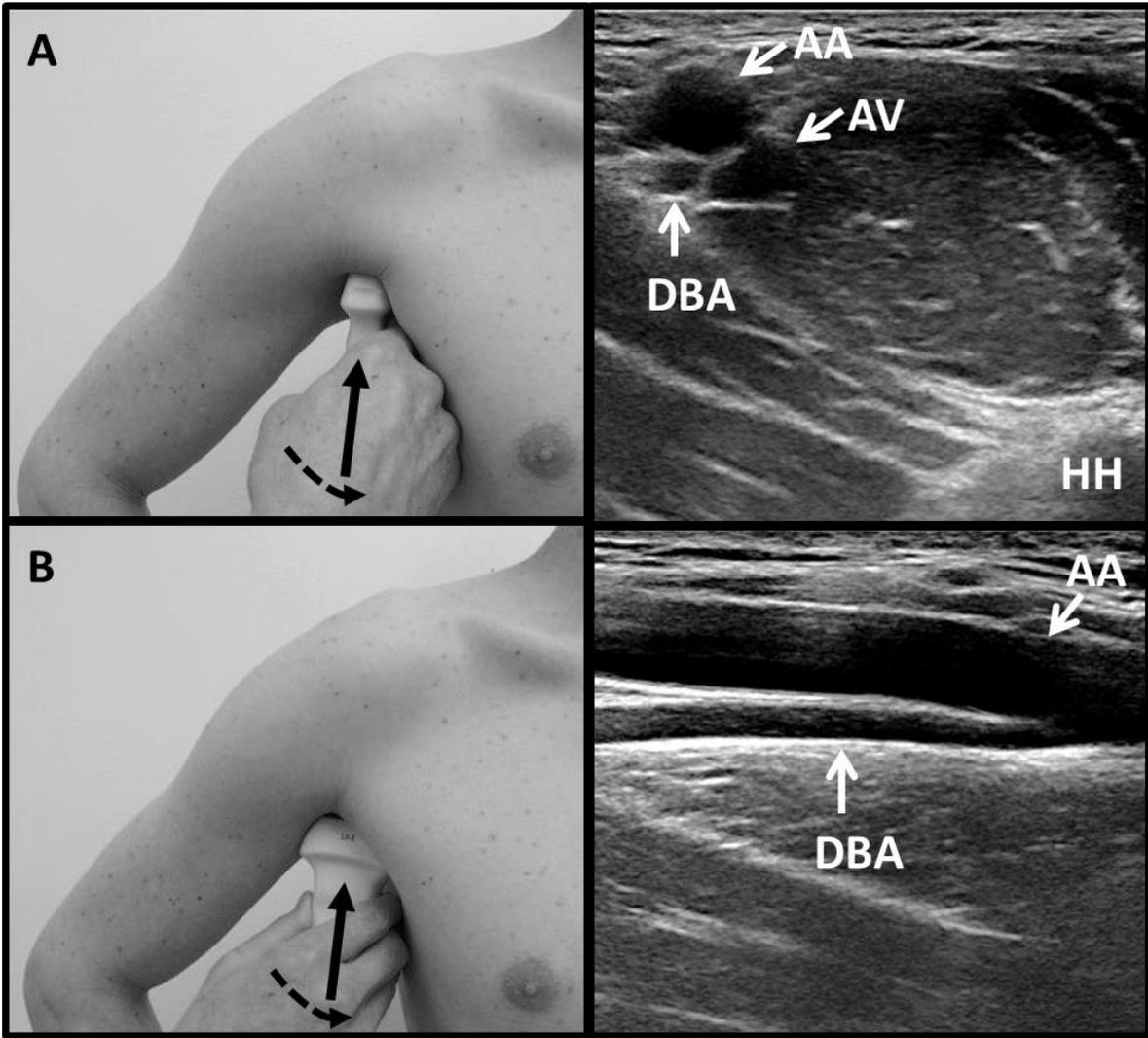


Figure 5

A. Cross-sectional view of the DBA; B. Longitudinal view of the DBA

AA, axillary artery; AV, axillary vein; DBA, deep brachial artery; HH, humeral head