

Abstract**Pre-Operative Duplex Ultrasound Mapping (DUSM) Evaluation Improves the Outcome of Arteriovenous Fistulas Creation**

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Background:

Pre-operative duplex ultrasound mapping (DUSM) is widely used for arteriovenous fistula creation and some authors even advocate that it be used routinely. To date, however, there are no prospective randomized data to support this suggestion. This study investigated whether routine preoperative vascular ultrasound results in better AVF outcome than physical examination. Preoperative duplex ultrasound mapping may increase options for AVF with identification of veins that are not clinically evident.

Materials and Methods:

Data was collected from operative records of patients who had native AVF creation from 2008 till 2012 (May). Epidemiological information types of AVF and preoperative duplex ultrasound mapping (DUSM) parameters such as diameter of radial artery (RA), brachial artery (BA), cephalic vein (CV) and basilic vein (BV) were obtained. A total of 159 AV fistula were created on 135 patients. We divided them into 2 categories 1) AVF with DUSM (N=104) and 2) AVF without DUSM that is been created by clinical judgment (N=55).

Results:

159 AVF were performed on 135 patients. Rate of re-do was 24 AVF from 19 patients. The median age of the patient was 53 years (19 - 79 years). The number of patients with preoperative duplex ultrasound was 104 while without duplex ultrasound or clinically measured was 55 patients. Radio- cephalic fistula (RCF) is the most performed AVF (53.5%), followed by brachial- cephalic fistula (BCF) (36.5%) and brachial basilic fistula (BBF) (10.1%). 104 patients had preoperative duplex ultrasound mapping (DUSM), and 70.6% of them had successful maturation. Out of those failed, only 10 patients had preoperative duplex ultrasound vein mapping; while 12 patients had no preoperative ultrasound vein mapping done. Rate of AVF maturation failure was 14.2%, mostly from BCF and RCF (n=8). The distribution of radial artery, basilic vein, and cephalic vein diameters were the same across categories of AVF ($p > 0.005$). However the distribution of brachial artery diameter is different between AVF categories ($p = 0.043$). The difference were found between BBF and BCF ($p = 0.039$). Most of the patients who had BV diameter greater than 2.0mm producing a successful maturation (n=62), followed by BA (n=58), CV (n=50) and RA (n=34).

Conclusions:

Routine preoperative vascular ultrasound in addition to clinical assessment improves AVF outcomes in terms of patency. Proper pre-operative assessment is essential in planning the best procedure possible for the patient. The evaluation must include both the arterial and venous systems to aid in the selection of the most appropriate conduits.