IMPACT OF ACCESS LOCATION AND COMORBIDITY ON ARTERIOVENOUS FISTULA FUNCTION

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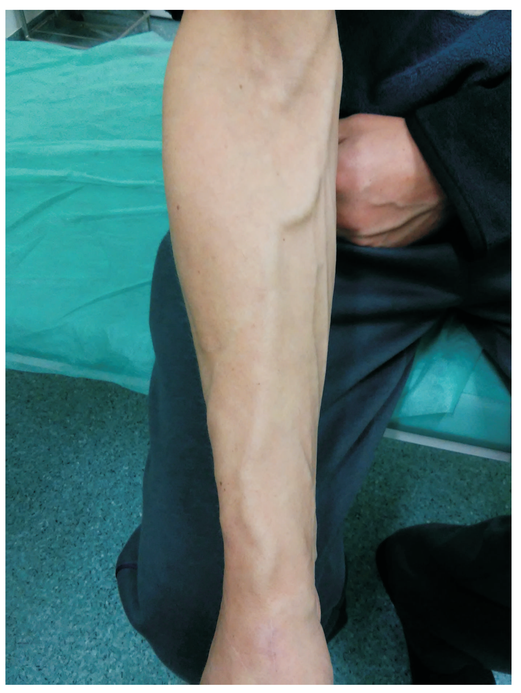
INTRODUCTION AND AIMS:

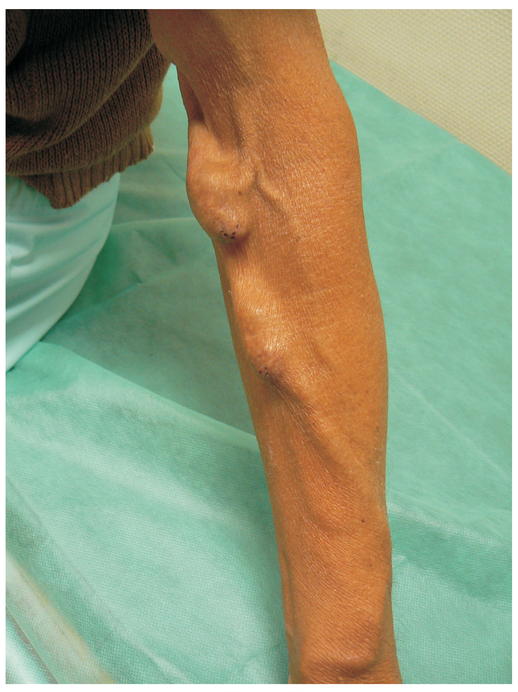
Arteriovenous fistula (AVF) is preferred vascular access for haemodialysis, because of low infection rate and relatively high patency. The most important problems related to AVF creation are non-maturation and stenosis occurrence resulting in access thrombosis. On the other hand, AVF creation could have negative consequences on cardiovascular system. Normal AVF flow ranges from 500 to 1500 ml/min. The aim of the study is to evaluate whether AVF flow is related to access location and clinical factors.

METHODS:

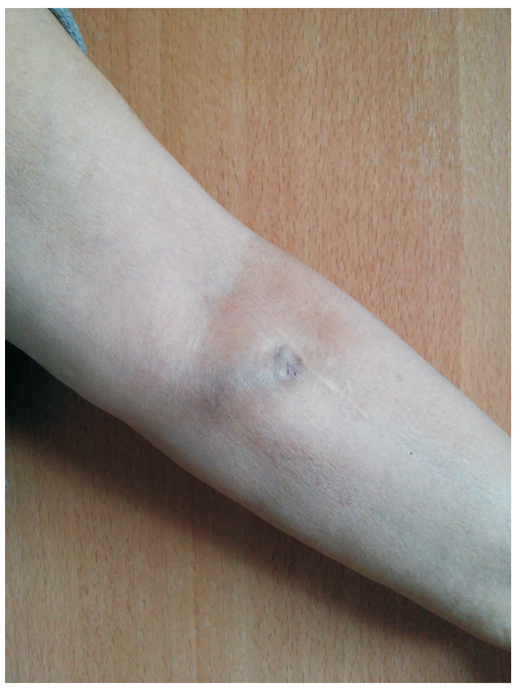
Doppler ultrasound of functioning AVFs performed by the same nephrologist experienced in vascular access care and clinical data were retrospectively analysed. All measurements were preceded by clinical assessment of AVF. According to examination AVFs were divided into three groups: well-functioning AVFs (170 AVFs, 68 %), AVFs with inflow stenosis (56 AVFs, 22.4 %), and AVFs with outflow stenosis (24 AVFs, 9.6 %). Brachial artery flow (Qa) was measured few centimetres above elbow. We identified 250 AVFs in 247 patients. Study group encompassed 136 (55.1 %) males and 111 (44.9 %) females; they were 18 to 88 years old. Mean age was 56±16.7 years. The majority of AVFs were located on forearm. There were 56 (22.4 %) snuffbox, 116 (46.4 %) distal forearm, 44 (17.6 %) proximal forearm and 34 (13.6 %) upper-arm AVFs. Data analysis was done with Statistica 10.0 software.



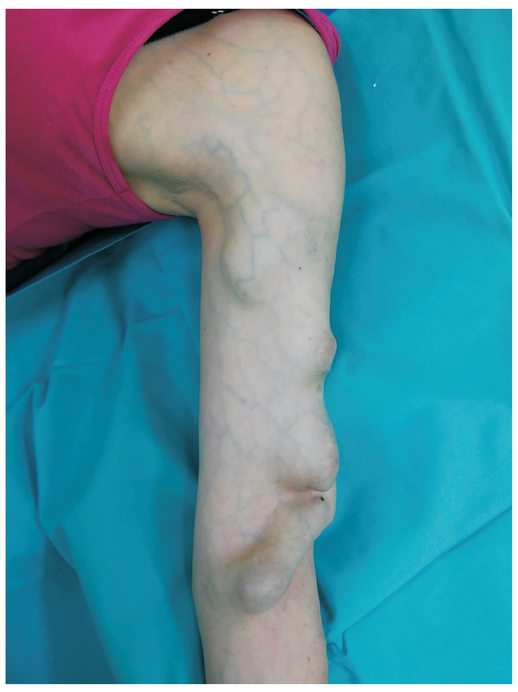
Snuff-box AVF. For snuff-box AVFs mean flow was 1007.7±465.7 mL/min and Qa>2 L/min was found with prevalence of 1.8 %.



Wrist AVF. For distal forearm AVFs mean flow was 1128±827.8 mL/min and Qa>2 L/min was found with prevalence of 12.1 %.



Proximal forearm AVF. For proximal forearm AVFs mean flow was 1380±1356.6 mL/min and Qa>2 L/min was found with prevalence of 15.9 %



Brachial cephalic AVF. For upper-arm AVFs mean flow was 1900.9±1216.8 mL/min and Qa>2 L/min was found with prevalence of 32.3 %.

RESULTS:

Qa for snuffbox, distal, proximal forearm and upper arm AVFs were 1007.7±465.7, 1128±827.8, 1380±1356.6 and 1900.9±1216.8 mL/min (p.<0.001), respectively. Qa for well-functioning AVFs, AVFs with inflow stenosis, and AVFs with outflow stenosis were 1504.6±926.3, 491.6±210.8 and 1224.1±592.2 mL/min (p<0.001), respectively. In patients with and without cardiovascular disease Qa were 1097.5±1023.6 and 1377.2±926.3 mL/min (p<0.025). In patients with and without diabetes Qa were 881.7±589.4 and 1444.3±1083.9 mL/min (p<0.001). Also women had lower Qa compared to men, 1124.2±840.8 vs. 1356.8±1073.7 mL/min (p<0.025). In patients older than 65 years Qa were similar to younger individuals, 1173.8±1074.2 and 1287±932.8 mL/min (p>0.1). Qa>2 L/min was found in one (1.8 %) snuffbox, in 14 (12.1 %) distal forearm, 7 (15.9 %) proximal forearm and 11 (32.3 %) upper-arm AVFs (p<0.001). Among patients with Qa>2 L/min prevalence of diabetes (12.1 vs. 37.8 %, p=0.0038) and cardiovascular disease (27.3 vs. 47.9 %, p=0.0264) was lower compared to patients with Qa≤2 L/min.

CONCLUSIONS:

AVF flow was related to access location, comorbidity and gender. Patients with comorbidities had lower access flow. Patients with proximal AVFs were at higher risk of hyper-flow vascular access. Those facts should be considered on access planning, creation and usage.

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