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Study to assess the role of doppler ultrasound in evaluation of arteriovenous hemodialysis fistula and the complications of hemodialysis access

ISHANK JAIN¹, VINAYA POORNIMA²

1. JUNIOR RESIDENT, DEPARTMENT OF RADIODIAGNOSIS, KASTURBA MEDICAL COLLEGE, MANGALORE, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL, KARNATAKA, INDIA.
Email ID : ishankjain9316@gmail.com
2. ASSOC. PROFESSOR, DEPARTMENT OF RADIODIAGNOSIS, KASTURBA MEDICAL COLLEGE, MANGALORE, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL, KARNATAKA, INDIA.
Email ID : drvinaya@gmail.com

CORRESPONDENCE ADDRESS AND EMAIL:

Dr. Ishank Jain, Department of Radiodiagnosis, Kasturba Medical College, Mangalore Manipal Academy of Higher Education, Karnataka – 575001, India, Email :
ishankjain9316@gmail.com Contact number - +919986821001

ABSTRACT:

Objective:

To determine sites for Arteriovenous fistula in hemodialysis patients, establish AVF Maturation, look for parameters which could predict an early graft complication and evaluate failed grafts.

Materials and Methods:

Ultrasound was performed prospectively for 63 consented patients with chronic kidney disease. Ultrasound was done using high frequency probe (9-12 MHz)(Shenoy & Darcy, 2013a) by an examiner to assess vessels for arteriovenous access. Eligible patients were followed up after surgery over 6 weeks to look for shunt maturation and evaluated on day 1, 14 and 42(Robbin et al., 2016) by assessing the diameter of the vein, depth of vein and the blood flow.

Results:

Out of the 63 patients on whom ultrasound was performed, 49 patients had undergone either radiocephalic or brachiocephalic fistula. 11 patients underwent brachiocephalic and 38 underwent radiocephalic fistula.

49 patients were followed up on day 1, day 14 and day 42 using doppler. 16 patients had mature fistula(>500ml/min)(*Introduction to Vascular Ultrasonography - 6th Edition*, n.d.) on day 1(32%); 27 on day 14(55%); 37 on day 42(75%). Doppler also provides parameters which could predict an early graft complication(Nalesso et al., 2018)

Conclusion:

Doppler provides an objective assessment of AV fistula for preoperative assessment and maturation in patients with chronic renal disease. Brachiocephalic fistulas were found to mature earlier as compared to radiocephalic fistulas. Doppler provides parameters which could predict an early graft complication in follow up visits. Finally, the current guidelines for maturation of KDIGO (Rule of 6)(Lok et al., 2020) could be modified with the vein diameter >4mm and blood flow >500 ml/min acceptable as sign of primary maturation for Indian population.