

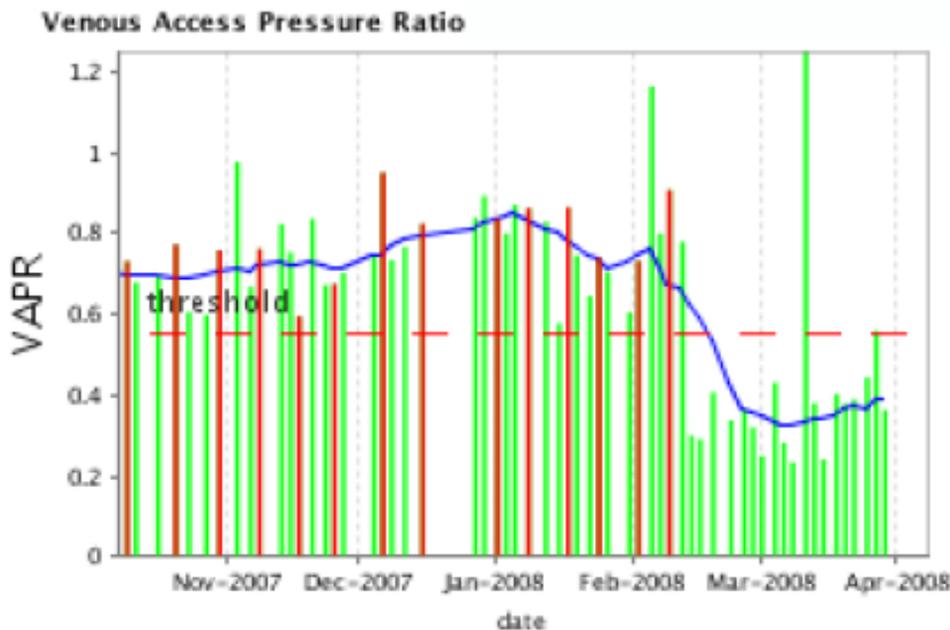


VASC-ALERT ACCESS SURVEILLANCE CASE STUDY

PATIENT PROFILE

81 year old male
Primary cause of ESRD: Diabetic and hypertensive nephrosclerosis
Dialysis start date: 3/18/06
Dialysis access: Right upper arm arteriovenous fistula
Dialysis access placed: 7/21/06
Treatment time: 3.5 hours / 210 minutes 3 times per week
Ordered BFR: 350 ml/min
URR result on 2/7/08: 77%

VASC-ALERT DATA



This patient had multiple high readings and alerts issued by Vasc-Alert. In the above VAPR graph each vertical green line indicates the average VAPR for the dialysis session. Each vertical red line indicates an alert that was issued. The horizontal red dashed line is a pre-set threshold value. The blue line is a moving average which is used to visualize the trend of the graph more easily. The red arrow indicates when an intervention took place. The dates on the graph are in month/day format.

The clinical staff was trying to get the patient in for an access study (no identified reason from the staff), but the patient refused to go until he saw his Vasc-Alert results. The patient had consistent alerts and an increasing trend of VAPR results above threshold. The patient was sent for a fistulogram on 2/13/08 based on Vasc-Alert results and was determined to have hemodynamically significant stenosis, so an angioplasty was performed. The red arrow on the graph indicates the drop in VAPR values below the threshold immediately after a fistulogram and angioplasty.

PROCEDURE AND FINDINGS

Written informed consent was obtained. The right upper arm was prepped and draped in a sterile manner. Intravenous Versed and Fentanyl were administered for moderate conscious sedation. Continuous cardiopulmonary monitoring was provided during the procedure. Total sedation and monitoring time was 45 minutes. The dilated right cephalic vein was then punctured near the level of the antecubital fossa and Seldinger technique was used to place a 6 French introducer sheath in antegrade fashion. Contrast fistulogram was then performed. Additional images were performed to reflux contrast into the arteriovenous anastomosis. The arteriovenous anastomosis appeared patent. The proximal right cephalic vein near the humeral head contained three severe stenoses. There was also a severe stenosis of the cephalic arch. Right subclavian and innominate veins were patent. The superior vena cava was patent.

A hydrophilic guidewire was then directed into the superior vena cava under fluoroscopy. A 9 mm diameter angioplasty balloon was inserted and used to dilate the three cephalic vein stenoses near the humeral head. A repeat contrast fistulogram was performed and showed a moderate degree of elastic recoil at all angioplasty sites. Therefore, a 10 mm diameter balloon was placed and angioplasty repeated at the proximal right cephalic vein. The 10 mm balloon was then exchanged for a 7 mm diameter balloon which was used to dilate the relatively long severe stenosis at the cephalic arch. Angioplasty at the cephalic arch was then repeated using a 9 mm diameter balloon. The procedure was completed under fluoroscopic guidance.

The final post angiogram contrast fistulogram was then obtained. Films were obtained during hand injection of Isovue 300 contrast material. There is a small degree of recoil at all stenotic sites in the cephalic vein. Including the cephalic arch lesion, there are four areas of stenosis. There is a mild thrill at the access in the upper arm, and history of prior difficulties with venous spasm, we elected to terminate the procedure at this point. Hemostasis was obtained at the puncture site using purse string suture closure. The introducer sheath was removed. No evident complication.

IMPRESSION

There were multiple recurrent, severe stenoses in the right cephalic vein including a relatively long lesion at the cephalic arch. Reasonable technical results were achieved following 10 mm diameter angioplasty at the cephalic vein in the upper arm, and 9 mm diameter angioplasty at the cephalic arch.

SUMMARY

The patient was sent for access study based on Vasc-Alert results and found to have several hemodynamically significant stenoses that were treated with angioplasty. Shortly after intervention the patient's VAPR results returned to normal and fell below the threshold.