

Novel Approach to Hemodialysis Reliable Outflow Device

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Introduction

Obtaining vascular access in end stage renal disease patients can become complicated after multiple access failures. Through a multidisciplinary approach, new and improved ways to achieve access have been discovered. Patients with severe central vein stenosis or occlusion typically require balloon angioplasty or stent placement. In patients with occluded central veins, in whom venous outflow is unattainable, a hemodialysis reliable outflow device (HeRO) can be placed. This device is a hybrid graft/catheter. Typically, the device is inserted through any large vein to access the superior or inferior vena cava.

At our institution, we were presented with a complex vascular access case that required a unique approach to obtaining an arteriovenous access.

Case

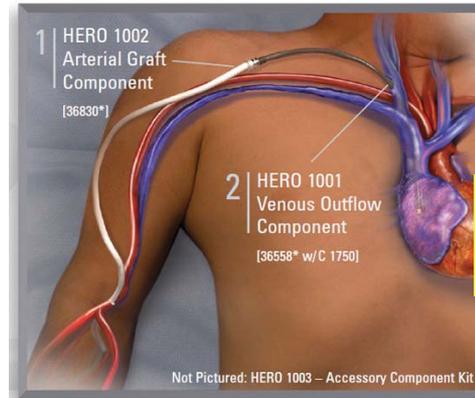
A 26-year old morbidly obese female with end stage renal disease presented with peritonitis and a malfunctioning peritoneal dialysis catheter due to a small bowel perforation. Her peritoneal catheter had to be removed.

The patient had numerous failed vascular accesses in the past, including AV grafts and tunneled hemodialysis catheters in her upper and lower extremities. She had central vein stenosis involving all central veins, including both superior and inferior vena cava. An attempted hemodialysis reliable outflow device placement using traditional approach had failed in past due to the severe stenosis and the tortuosity of her venous anatomy. She was started on peritoneal dialysis and continued this for approximately one year prior to this episode of peritonitis.

Given her difficult access history, discussions were initiated for hospice and end of life care. Fortunately, due to minimal residual renal function, the patient was able to survive 3 weeks in the hospital on severe dietary restrictions. After further multidisciplinary discussion, an innovative plan for hemodialysis reliable outflow device placement was made. Cardiothoracic surgery along with transplant surgery worked in tandem to perform median sternotomy and inserted the device catheter through the infraclavicular space. Pericardium was opened, the atrial appendage was removed and the catheter was placed in the right atrium. Transplant surgery anastomosed a Gore-Tex graft to the brachial artery, and connected this to the catheter component of the device. After 14 days of maturation, the device was accessed successfully. The patient has been dialyzing without problem for over a month now.

Conclusion

Central vein stenosis can jeopardize ipsilateral vascular access, but this can be overcome via creative approaches. Multidisciplinary approach, like in our patient with extensive central stenoses, can innovatively create new access. Consideration of all options is essential to enable these patients to receive a life-saving access. Of course, prevention of central vein stenosis with early referral for vascular access placement prior to the initiation of dialysis is the best approach.

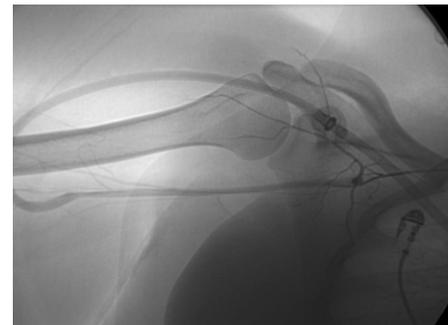


Courtesy of hemosphere.com



Central component of the device anastomosed to the right atrium

Peripheral component of the device anastomosed to the brachial artery



References

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