Pitfalls in Distal Radial Artery Ligation for Dialysis Access Related Steal Syndrome
Dzenan Lulic, MD, Raha Borazjani, PA-C, and Eric Ladenheim, MD
LDAC Vascular Centers, Fresno California

INTRODUCTION
Dialysis access related steal syndrome (DASS) is seen in 1-4% of patients with radiocephalic arteriovenous fistulas (RCAVF). Common treatments include surgical ligation or embolization of the distal radial artery (DRA) to stop retrograde flow through the DRA. If the DRA is not ligated proximal to the bifurcation of the palmar and dorsal branch there is a real possibility of DASS recurrence.

GOALS
- Present a case of DASS treated by DRA ligation in which the DASS recurred
- Highlight pitfalls that may occur in DRA ligation

MATERIALS & METHODS
A case study is presented of a patient with a RCAVF and DASS treated by DRA ligation who experienced recurrent symptoms because of an un-ligated radial artery branch. Patient underwent clinical evaluation including physical examination and ultrasound evaluation of flow in DRA and distal ulnar artery (DUA) with color Doppler along flow volume measurements RCAVF measurements using Duplex methodology (Aloka Alpha 6, Hitachi Aloka Medical, Inc.). Recurrent symptoms were managed by surgical re-ligation of DRA closer to the anastomosis.

RESULTS
A 50 year old man had been receiving chronic hemodialysis for 5 years with a right RCAVF. He experienced the gradual progressive onset of right hand paresthesia and pain. He had ligation of DRA and his symptoms resolved (Fig. 1). He remained symptom free for 14 months but began experiencing intermittent hand pain, worse at night.

Physical examination:
- hand was tepid
- thrill was present in DUA and RCAVF.

Ultrasound examination:
- DUA was patent with presence of turbulent flow (Fig. 2a)
- Patent dorsal branch of the DRA (Fig. 2b)
- Reversal of flow in DRA (Fig. 2c) which was comparable to direction of the blood flow in RCAVF (Fig. 2d)
- Duplex ultrasound demonstrated an intra-access flow of 772 ml/min (Fig. 2e)
- Digital compression over DUA did not significantly decrease the flow in AV fistula (660 ml/min) which indicated patent proximal radial artery

Treatment:
- Ligation of DRA close to the RCAVF anastomosis resolved his symptoms immediately (Fig. 1)

Postoperative clinical course:
- 2 months after re-ligation of DRA, patient remained symptom free with an AVF flow of 822 ml/min (Fig. 2f)

CONCLUSIONS
Ligation of DRA for DASS should be performed close to the anastomosis of the RCAVF. Without ligation close to the anastomosis, recurrent symptoms can develop over time due to persistent flow through an un-ligated branch.

Other pitfalls to avoid include:
- failure to recognize proximal radial artery stenosis (atherosclerosis)2,3
- small vessel disease (diabetic microangiopathy and endothelial dysfunction)2

REFERENCES

CONTACT
Dzenan Lulic, MD
LDAC Vascular Centers
6145 N Thesita St
Fresno, CA 93710
Email: dliuc@lulicmed.com