

## Publication Brief

# Flow reduction in high-flow arteriovenous fistulas improve cardiovascular parameters and decreases need for hospitalization

Balamuthusamy S, Jalandhara N, Subramanian A, Mohanaselvan A, Interventional Nephrology Division, Tarrant Vascular Access Center, and Tarrant Nephrology Associates, Fort Worth, Texas, USA.

### INTRODUCTION

Patients with prevalent arteriovenous (AV) fistulas exhibit high output heart failure and pulmonary hypertension. Fistulas with flows >2000 mL/minutes are more likely to induce changes in cardiac geometry and pulmonary artery pressure.

### OBJECTIVE

To study the effects of reducing flow in high flow AV accesses to between 600 mL/min to 1200 mL/min.

### METHODS

- Data of 12 patients with proximal arm fistulas with AV access flows of 2 L/min or more, who had been hospitalized for acute congestive heart failure, were retrospectively analyzed. The patients' mean age was 64.7 years; 80% had diabetes, and 41% had coronary artery disease.
- Their mean access flow pre-banding was 3,784 mL/min.
- All patients underwent banding of their inflow at the anastomosis with perioperative access flow measurement.
- Cardiac output and access flow were measured with the Transonic Hemodialysis system.
- Patients were monitored 2–4 weeks after the inflow banding and then subsequently at 3 and 6 months. 2D echo was performed at 6 months postbanding in addition to access flow and clinical evaluation.

### RESULTS

- Mean post-banding flows for the twelve study participants was 1178 mL/min.
- Banding resulted in a statistically significant decrease in cardiac output from 7.06 L/min to 6.47 L/minutes, pulmonary systolic pressure from 54 mmHg to 44 mmHg and left ventricular mass index from 130 g/m<sup>2</sup> to 125 g/m<sup>2</sup>.
- The hospitalization rate for acute congestive heart failure decompensation decreased from 3.75±1.2 in the six months prior to banding to 1.08±1.2 postbanding.
- New York Heart Association's staging classification for heart failure improved by 1 stage with banding.
- Hemoglobin levels, predialysis systolic blood pressure, calcium phosphorous product and the use of Renin Angiotensin Aldosterone System (RAAS) blockade agents and calcium channel blockers were comparable before and after banding.

### CONCLUSION

Flow reduction in high flow fistulas is associated with decreased left ventricular mass index and pulmonary artery pressures. There is also a significant reduction in the risk for hospitalization due to acute heart failure and an improvement in New York Heart Association's heart failure stage.

### TAKE HOME

- Study demonstrates the positive effects of banding on high flow hemodialysis patients.
- The authors advise aggressive monitoring of access performance in the first weeks after banding, recommending access flow and urea kinetics assessment every 2 months for 6 months after the initial banding procedure.
- The authors used the Hemodialysis Monitor to measure cardiac output and vascular access flow.

### REFERENCES

Balamuthusamy S, Jalandhara N, Subramanian A, Mohanaselvan A. Flow reduction in high-flow arteriovenous fistulas improve cardiovascular parameters and decreases need for hospitalization, "Hemodial Int. 2016 Jul;20(3):362-8. (Transonic Reference # HD11223AH).