Ultrasound and Fluoroscopy guided Balloon angioplasty in patients with nonmaturing arteriovenous fistulas not yet receiving hemodialysis may lead to poor results

Eric Ladenheim MD, Nathan Chadwick PA-C, Donna Smith PA-C, Theresa Dunaway RN
Ladenheim Dialysis Access Center, Fresno California

Results
If we only consider the flow and diameter before and after the intervention, and assume each procedure was independent then there was a significant improvement between the mean intra-acess flow rate and mean diameters pre-PTA and post-PTA.

- PTA access flow (mL/min) 279.23 (160.20) 306.05 (157.90) 116.31 (187.70) 2.477 *
  - PTA diameter (mm) 5.17 (0.33) 5.80 (0.43) 6.82 (0.45) 3.681 *

Since the 8 PTA’s were done on 5 patients and some patients had repeated procedures the initial assumption of independence is questionable. In addition, the repeated follow up tests that show drop off in flow need to be taken into account. The Friedman test is a nonparametric test used to detect differences in treatments across multiple test attempts. It showed no significant improvement in flows or diameters.

Contact information
Eric Ladenheim MD
6057 N First Street
Suite 104
Fresno California 93710
Phone: 559-446-1065
E-mail: eladenheim@ladenheim.net

Conclusions
While all procedures were technically successful, few patients actually had their fistulas cannulated successfully. Recoil was common in these patients: despite duplex monitored technical adequacy of the 8 angioplasties had no significant improvement in access flow when measured 3-5 days later. Restenosis was common in this group of patients. Two of the five that had significant improvements in access flow (104ml/min to 334ml/min improvement) found flows regressed within 4-6 months to where they no longer met criteria for cannulation.

Discussion
While all procedures were technically successful, few patients actually had their fistulas cannulated successfully. Recoil was common in these patients: despite duplex monitored technical adequacy of the 8 angioplasties had no significant improvement in access flow when measured 3-5 days later. Restenosis was common in this group of patients. Two of the five that had significant improvements in access flow (104ml/min to 334ml/min improvement) found flows regressed within 4-6 months to where they no longer met criteria for cannulation.

References

Protocol for Ultrasound/Fluoroscopic Guided Angioplasty
- Sheath insertion, guide wire passage, and balloon positioning were guided by ultrasound and fluoroscopy.
- Duplex ultrasound was utilized to localize the stenotic lesions and ultrasound was used to select the appropriate balloon size and assess the technical adequacy of the procedure. Technical success was assessed by less than 30% percent residual stenosis after PTA.
- Balloons used were 4mm-5mm for the arterial anastomosis and 5mm-7mm for the post-anastomotic portions of the fistula, including the swing point. Pressures up to 20 Atmospheres were used.
- Full effacement of the balloon was achieved in each case without the use of cutting balloons. There was one episode of rupture treated by prolonged low pressure balloon inflation.
- Flow and diameter was measured 3-5 days after intervention. If they met criteria for cannulation (see above) then cannulation was initiated.
- Follow up measurements of Flow and diameter was done 5-6 weeks after PTA

Lack of sustained improvement in diameter was a problem too.