

Can Vessel Preparation Reduce the Need for High Pressure Balloon Angioplasty in Arteriovenous Access Treatment?

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Objectives: A failing hemodialysis arteriovenous access is often a reoccurring and costly problem for many patients. The current standard of care is a plain old balloon angioplasty (POBA) at high inflation pressures to dilate the lesion. The high pressures can be painful for the patient, can cause venous rupture, and long-lasting results have remained elusive. Prepping the vessel with a novel scoring device could increase the life of the access, improving patient outcomes.

Methods: Acute, single operator, retrospective data from twenty-four patients were analyzed between May 2017 and September 2017. Each patient presented for an arteriovenous intervention due to either a pulsatile AV (4.2%), poor access (4.2%), inefficient dialysis (8.3%), or poor flow rate (83.3%). The lesions were prepped with the FLEX Catheter® (VentureMed Group, Toledo Ohio), a 3 atherotome, non-balloon vessel preparation device that modifies the stenosis during pull-back, prior to POBA. The mean age was 61 years old, with 75% of subjects being male. The reduction in stenosis was recorded after vessel preparation and after POBA. The opening pressure, defined as the lowest pressure required to obtain full lesion effacement, was recorded along with the maximal pressure.

Results: Arteriovenous fistulas comprised 67% (16) of the cases, the remaining 33% (8) were arteriovenous grafts. Average vessel diameter was 8.3 mm (6 – 10) and the average lesion length treated was 36.3 mm (20-120). Before treatment the average stenosis was 80% (50-90). The FLEX was utilized to prepare the vessel with an average of 3 (2 – 5) retrograde pullbacks per lesion. The luminal gain achieved after vessel preparation averaged 24.6% (10-50). Subsequently, POBA was administered with an average balloon size of 8 mm (6 – 10). The average opening pressure was 8.1 atm (4 – 16), with an average maximal pressure of 17 atm (9 – 24). The average residual stenosis was 5.2% (0 -10), creating an average luminal gain of 74.8% (45 – 90) post procedure.

Conclusion: Arteriovenous access stenosis can be treated with lower pressures, potentially reducing the rate of re-intervention and procedural complications. Vessel preparation created an optimal environment for angioplasty at lower pressures resulting in a significant reduction in stenosis.