

## AV Fistula Salvage with Novel Patch-Wrap Technique

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**Objective:** Aneurysmal arteriovenous fistulae (AVF) develop due to causes including outflow stenoses and needle trauma. AVF dilatation can lead to high flows resulting in congestive heart failure and/or steal syndrome. A unified strategy to address these problems has not been reported. Preliminary results from our unified approach to impending AVF failure are presented.

We used a 4-tiered approach to AVF salvage. 1. easing of outflow obstruction using percutaneous intervention, 2. banding excessive inflow using Transonic® flow probe (TFP) measurement, 3. novel Patch-Wrap (ZPW) using a graft to correct, strengthen, and band aneurysmal portion of the AVF, and 4. place the wrapped AVF under new skin.

**Methods:** Outflow stenoses were radiologically found and treated. AVF flow was measured intraop using either 2-crystal or 4-crystal Confidence TFP. The aneurysmal wall of the AVF is either excised/repared or involuted to create a size like the non-aneurysmal portion of AVF. ZPW uses longitudinally cut PTFE or Artegraft® grafts to tubular or spiral wrap the AVF depending on AVF size. The wrap limits inflow for AVF's with flow >1500 cc/min or symptomatic steal. The modified AVF is repositioned under a lateral sub-Q flap for better coverage and cannulation.

**Results:** 105 procedures were performed in 81 patients since 2005; 55 used PTFE and 50 had Artegraft. Indications included aneurysmal dilatation (66), steal (13), hemorrhage (6), and central occlusion (5). 18 required multiple ZPW's and the majority continue to function long-term.

**Conclusions:** Optimizing blood flow can save centrally occluded AVF's, correct steal, and prevent surgical intervention of cephalic arch stenoses by matching inflow and outflow. Intraoperative flow measurement by TFP aids precise banding for correction of steal and lower intra-AVF pressure. ZPW for fistula salvage is adaptable to circumstances. By keeping the patient's blood in contact with autogenous vein wall lifespan of the conduit should be optimized. Our novel ZPW technique salvages failing AVF's by supporting them with external graft material thereby extending the life of the AVF. This technique prevents or delays aneurysmal recurrence due to persistent stenoses and ongoing needle trauma. The dysfunctional AVF is salvaged rather than replaced with graft decreasing long-term morbidity.