Publication Brief

Effect of Central Venous Angioplasty on Hemodialysis Access Circuit Flow: Prospective Study of 25 Symptomatic Patients

BACKGROUND
KDOQI Guidelines set a 20% increase in flow to call a central venous percutaneous transluminal angioplasty (PTA) intervention successful in correcting the underlying problem.

OBJECTIVE
To quantify the effect PTA on blood flow within hemodialysis access circuits in patients with symptomatic central venous stenosis (CVS) by measuring flow pre and post intervention with the HVT100 Endovascular Flowmeter and ReoCath Flow Catheter.

STUDY
• Prospective study: 7 fistulae, 15 grafts, and 3 hybrid (combination of fistula and graft) access circuits.
• Study: 30 adults with symptoms attributable to CVS ipsilateral to their access.
  - Five subjects disqualified due to lack of CVS (n = 1), untreatable lesion (n = 1), or improper flow measurement timing (n = 3);
  - 25 completed the study (15 men and 10 women; mean age, 62 yr; age range, 33-87 yr).
• 11 patients had only CVS; 14 had at least 1 peripheral lesion in addition to CVS.
• Mean access age was 675 days (range, 16 - 3,039 days).
• Mean CVS symptom duration was 37 days (range, 3 - 120 days). Symptoms included swelling of the arm (n = 20), face (n = 2), leg (n = 2) and breast (n = 1).
• All stenoses underwent PTA.
• Intraaccess flow was measured immediately before and immediately after CVS treatment with PTA/stent.

RESULTS

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<tr>
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<th>Mean Flow</th>
<th>Mean Flow Increase</th>
<th>Mean Flow Decrease</th>
<th>Decrease in CVS Symptoms</th>
<th>CVS symptoms Recurrence</th>
<th>Mean Followup</th>
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<tbody>
<tr>
<td><strong>Pre PTA</strong></td>
<td>1,424 mL/min (range, 565 - 2,765)</td>
<td>111 mL/min (15%) ± 456 mL/min</td>
<td>9 patients (36%)</td>
<td>Decreased in 24 patients (96%)</td>
<td>Recurred in 14 patients (58%) (average 110 days after first PTA; range, 7 - 459 days)</td>
<td>371 days (range, 17 - 592 days)</td>
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<td><strong>Post PTA</strong></td>
<td>1,535 mL/min (range, 598 - 2,545)</td>
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CONCLUSIONS
• CVS symptoms occurred over a wide range of blood flow rates.
• PTA increased access blood flow by only 15% on average, yet relieved symptoms in 96% of patients, suggesting that access flow changes might not be a criterion for successful CVS symptomatic treatment.
• In most fistula patients, access blood flow decreased in CV PTA/stent placement, compared with an increase in those with grafts and hybrid accesses.
• Pretreatment access flow did not correlate with the presence of CVS symptoms.

REFERENCE: