Temporary Endovascular Bypass for the Treatment of Ischemic Stroke: Experiences after 104 Patients

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Mechanical thrombectomy has become a valuable addition to the endovascular treatment options for ischemic stroke. However, conventional thrombectomy leads to reperfusion only after complete thrombus removal. A promising alternative is the use of stents that ease the clot and allow for immediate reperfusion by permanent stenting in stroke. However, this introduces new complications. The sphere of the occluded segment must not exceed that of the stent. Failure to achieve reperfusion after placement of the stent may make consecutive accesses of mechanical thrombectomy difficult or impossible. In addition, permanent stent placement mandates the immediate use of antplatelet drugs. In combination with fibrinolytics, heparin, and cerebral damage in the affected territory this may potentially increase the risk of subsequent hemorrhage.

Patients: 104 patients (53 female, 51 male) with 108 occlusions were treated in the following locations:

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<th>ACI - T</th>
<th>M1</th>
<th>M2</th>
<th>ACA</th>
<th>VA - BA</th>
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<tr>
<td>18</td>
<td>54</td>
<td>6</td>
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<td>24</td>
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The mean NIHSS score in the anterior circulation was 15.3 pre / 7.61 post treatment. 13 out of 84 patients with occlusions in the anterior circulation died.

In the posterior circulation the NIHSS score was 15.7/7.5 with a mortality of 11/23; here NIHSS of the survivors was 11.8 / 7.5.

The clinical outcome could only be obtained at hospital discharge for a sufficient number of patients. The number of patients with a good clinical outcome (mRS 0-2) was 20/78 (=25.6%) overall and 18/60 (=30%) in the anterior circulation.

Recanalization: TIMI II/III was achieved in 92.5%. TICI 2b/3 was achieved in 79%

Procedural data: The majority of patients was treated in conjunction with either iv- or ia-fibrinolysis (iv: 58; ia: 32pts. - bridging concept).

The mean onset-to-reperfusion time was 265min. (min=56, max=1031); median= 230min.

The mean angio-to-reperfusion time was 47min. (min=5, max=186); median= 38.5min.

The Solitaire was used as the only device in 25/108 procedures. In the majority of cases it was used in conjunction with a proximal aspiration/distal access catheter (42x Penumbra reperfusion cath., 20x Concentric DAC). Other multimodal approaches included phenox pCR/CRC, Merci L5, Penumbra, Stents, and pta balloons. 25 procedures were monomodal, 52 bimodal, 18 trimodal, and in 15 proc. 4 or more systems were applied. In 15 pts., carotid stenting was needed.

The mean number of passes for mte was 2.46 (median 2, max=12).

72.8% had TIMI II/III perfusion during/after the 1st deployment.

Deployment: 1st 2nd 3rd
Reperfusion: 2a:45; 2b:12, 3:8
2a:34; 2b:8, 3:1
2a:15; 2b:11, 3:5

In 15/108 procedures, the Solitaire was only used as a temporary bypass. In 83/93, mechanical thrombectomy was successful with 10/93 attempts were unsuccessful.

In 10 procedures, an underlying stenosis was treated; 7 Solitaire stents were permanently implanted; in 14 pts., self-expandable stents other than Solitaire were applied.