Stent retriever thrombectomy

- Contact Aspiration Alone or Combined With Stent Retriever Thrombectomy for Middle Cerebral Artery Large Vessel Occlusion
- Waveform-assisted navigation (WAN) technique to visualize the appropriate position of the aspiration catheter to the thrombus during mechanical thrombectomy
- Unmet Needs in Acute Ischemic Stroke: Overcoming Recalcitrant Clots
- Diagnostic performance of CT perfusion in detecting contralateral aplasia of the A1 segment in acute internal carotid artery occlusion
- Acute Distal Internal Carotid Artery Occlusion in Which Angiography during Mechanical Thrombectomy Revealed a Shunt between the Internal Carotid Artery and the Cavernous Sinus: A Case Report
- Types of stent retrievers used in mechanical thrombectomy for acute ischaemic stroke: A scoping review
- Stent-Retriever Thrombectomy in STEMI With Large Thrombus Burden: The RETRIEVE AMI Randomized Trial
- Does endovascular thrombectomy using super-bore 0.088" large distal platform offer advantages over balloon guide catheters in acute ischemic stroke secondary to large vessel occlusion?

Stent retriever-based thrombectomy is a medical procedure used to treat ischemic strokes caused by a blood clot (thrombus) blocking a major blood vessel in the brain. This technique is a form of mechanical thrombectomy and is considered a significant advancement in the treatment of acute ischemic stroke treatment.

see Stent retriever for acute ischemic stroke treatment.

Procedure

Access: The procedure is performed under imaging guidance (usually fluoroscopy or angiography). A catheter is advanced through the blood vessels from the groin to the site of the clot in the brain. Clot Retrieval: The stent retriever is then carefully navigated to the location of the blood clot. Deployment: The stent retriever is deployed, allowing the stent to expand and capture the clot. Retrieval: The device is then slowly withdrawn, bringing the trapped clot along with it. Effectiveness:

Stent retriever-based thrombectomy has been shown to be highly effective in improving outcomes for patients with acute ischemic stroke caused by large vessel occlusion (LVO). Rapid removal of the clot can potentially minimize brain damage and improve neurological recovery. Time Sensitivity:

The success of thrombectomy is time-dependent, and the procedure is most effective when performed as quickly as possible after the onset of symptoms. This time sensitivity has led to efforts to streamline systems of care, emphasizing the importance of rapid evaluation and treatment for eligible patients. Patient Selection:

Stent retriever-based thrombectomy is typically reserved for patients with specific criteria, including the type and location of the clot, the time since symptom onset, and the patient's overall health. Post-Procedure Care:

Patients who undergo stent retriever thrombectomy are closely monitored in the post-procedural period for complications and are often managed in a specialized stroke care unit. This procedure has become a standard of care for eligible patients with acute ischemic stroke caused by large vessel occlusion, and it has significantly improved outcomes and reduced disability in many cases. However, it's important to note that not all patients are eligible for this procedure, and decisions about treatment are made on a case-by-case basis. The field of stroke care continues to evolve with ongoing research and advancements in technology.

Stent retriever (SR) thrombectomy is commonly used for the treatment of emergent large vessel occlusion (ELVO) in acute ischemic stroke. Clot imaging parameters such as clot length, diameter, distance to the internal carotid artery terminus, and vessel angle where the SR is deployed may predict the likelihood of achieving first pass effect (FPE).

Stent retrievers. Due to higher success rate, stent retrievers have become the method of first choice for clot removal in embolic stroke. The recanalization rate is 88.8 – 100% [1) 2) 3) 4)].

Currently available are Solitaire and Trevo. A 7 or 8 Fr sheath is placed in the femoral artery, through which a 6 Fr balloon guide catheter is positioned in the ICA (in case of anterior circulation strokes). Angiography is performed to identify site of occlusion. Using fluoroscopy and road mapping, a microcatheter is advanced over a microwire, across the site of occlusion. The microwire is removed and the stent retriever is advanced through the microcatheter such that it extends proximal and distal to the clot. The stent retriever is unsheathed by retracting the microcatheter as the retriever is maintained stationary. The stent retriever expands to its actual size and this results in restoration of flow in the occluded artery. After five minutes, the balloon on the guide catheter is inflated to arrest blood flow. Maintaining gentle aspiration on the guide catheter, the stent retriever and microcatheter are retracted simultaneously. Once both the microcatheter and retriever are with- in the guide catheter, vigorous aspiration is applied as the two devices are concurrently retracted and removed from the patient. Angiography is performed to confirm reconstitution of circulation. Some surgeons administer a small amount of i.a. tPA as ‘mop up’ after mechanical thrombolysis, to address potential distal debris. Vessel perforation during stent retriever withdrawal has been reported [5)].

In a multicenter, prospective, randomized, controlled, open-label, adaptive, noninferiority trial with blinded primary end point evaluation. Between October 2019 and February 2022, multicenter participation occurred across 19 research hospitals and/or universities in the US and 5 in Germany. Patients with LVO stroke were enrolled and included up to 8 hours after symptom onset.

Interventions: Patients underwent 1:1 randomization to thrombectomy with the pRESET or Solitaire stent retriever.

Main outcomes and measures: The primary outcome was the difference in the rate of 90-day functional independence across the 2 devices, using a -12.5% noninferiority margin for the lower bound of the 1-sided 95% CI of the difference between pRESET and Solitaire retrievers.

Results: Of 340 randomized patients, 170 (50.0%) were female, and the median (IQR) age was 73.0 (64.0-82.0) years. The study procedure was completed in 322 of the 340 randomized patients. The

primary end point of 90-day functional independence was achieved by 95 patients (54.9%; 95% CI, 48.7-61.1) in the pRESET group and in 96 (57.5%; 95% CI, 51.2-63.8) in the Solitaire group (absolute difference, -2.57%; 95% CI, -11.42 to 6.28). As the lower bound of the 95% CI was greater than -12.5%, the pRESET retriever was deemed noninferior to the Solitaire retriever. The noninferiority of pRESET over Solitaire was also observed in the secondary clinical end point (90-day shift in modified Rankin Scale score) and in both angiographic end points (Expanded Treatment in Cerebral Infarction [eTICI] score of 2b50 or greater within 3 passes: 146 of 173 [84.4%] vs 149 of 167 [89.2%]; absolute difference, -4.83%; 95% CI, -10.84 to 1.19; eTICI of 2c or greater following the first pass: 76 of 173 [43.7%] vs 74 of 167 [44.3%]; absolute difference, -0.63%; 95% CI, -9.48 to 8.21). Symptomatic intracranial hemorrhage occurred in 0 patients in the pRESET group and 2 (1.2%) in the Solitaire group. Mortality occurred in 25 (14.5%) in the pRESET group and in 24 (14.4%) in the Solitaire group at 90 days. Findings of the per-protocol and as-treated analyses were in concordance with findings of the intention-to-treat analysis.

In this study, among patients with LVO stroke, thrombectomy with the pRESET stent retriever was noninferior to thrombectomy with the Solitaire stent retriever. Findings suggest that pRESET offers a safe and effective option for flow restoration and disability reduction in patients with LVO stroke [6].

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