

In Neurology

MECHANICAL THROMBECTOMY:

When the stroke is caused due to occlusion of large arteries like Internal Carotids or the proximal Middle Cerebral Artery, the recanalization rates with thrombolysis alone maybe poor. In such situations, the role of endovascular procedures like mechanical thrombectomy has come to the fore. There are two basic forms of devices used in endovascular therapy –

1. **Stent Retrievers** – These devices deploy a stent across the clot. The clot is engaged by the stent and retrieved together.

Examples - Solitaire FR, Trevo ProVue, pRESET, TIGER triever

2. **Aspiration devices** – These devices are placed proximal to the clot and aspiration is achieved, restoring the flow.

Examples - Penumbra, QuickCat, Pronto

(MR CLEAN – Multicenter Randomized Clinical Trial of Endovascular Treatment in Acute Ischemic Stroke in Netherlands, EXTEND-IA – Extending the time for thrombolysis in Emergency Neurological Deficits – Intra Arterial, ESCAPE – Endovascular Treatment for Small Core & Anterior Circulation Proximal Occlusion with emphasis on minimizing CT to recanalization time, SWIFT-PRIME – Solitaire with Intervention for Thrombectomy as Primary Endovascular Treatment, REVASCAT – Randomized Trial for revascularization with Solitaire device versus best medical therapy in the treatment of acute ischemic stroke due to anterior circulation stroke with large vessel occlusion within 8 hours of symptom onset, M- Middle Cerebral Artery, A-Anterior Cerebral Artery, TICI – Thrombolysis In Cerebral Infarction, NNT- Number Needed to Treat, mRS- modified Rankin Score.)

Most of these trials had strict inclusion and exclusion criteria. But in essence as of today, an ideal candidate for thrombectomy is a person:

- Aged more than 18 years
- NIHSS score of >6
- Good pre-stroke functional status
- An ASPECTS (Alberta Stroke Program Early CT Score) score >6
- Presence of an LVO and sizeable penumbra.

Table : Shows the major clinical trials on mechanical thrombectomy in LVO-Stroke

	MR CLEAN	EXTEND-IA	ESCAPE	SWIFT - PRIME	REVASCAT
Occlusion site chosen	Distal ICA/ M1/ M2/ A1/ A2	ICA / M1 / M2	ICA / M1 / M2	Intracranial ICA / M1	Intracranial ICA / M1
Intervention used	Intra arterial thrombolysis	Solitaire stent retriever	Choice of the interventionist	Solitaire stent retriever	Solitaire stent retriever
Time from stroke onset allowed	6 hours	4.5 hours	10 hours	4.5 hours	8 hours
Number of patients	500 (233 vs 267)	70 (35 vs 35)	315 (165 vs 150)	196 (98 vs 98)	206 (103 vs 103)
TICI score 2b-3 (%)	58.7%	86%	72.4%	88%	65.7%
NNT to achieve mRS of 0-2	7.1	3.2	4.2	4.0	6.3

The penumbra was defined in the DEFUSE-3 trial, as a mismatch on CT perfusion of >15ml, with a core volume <70ml in an extended time window of 6-16 hours post symptom onset. While the DAWN trial took into consideration a clinical-radiological mismatch, coming within a period of 6-24 hours after onset of stroke.

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