

# THROMBECTOMY IN ACUTE ISCHEMIC STROKE: STENTRIEVER EXPERIENCE IN MODENA HOSPITAL

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on behalf the Italian Registry of Endovascular Treatment in Acute Stroke



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## Background

Endovascular treatment (ET) in ischemic stroke patients produces high rate of recanalization and may improve good outcome in patients with documented large vessel occlusions.

## Material and methods

we analysed acute ischemic stroke patients admitted at the **Nuovo Ospedale Civile S.Agostino-Estense in Modena** in the period **2008-2014** and underwent to endovascular therapy<sup>1</sup>. All patients were registered in **the Italian Registry of Endovascular Treatment in Acute Stroke**<sup>2</sup>. Efficacy measures were arterial recanalization (TICI 2b-3), and 3-month functional outcome (mRS) and mortality.

## Results

in the period 2008-2014 we treated **238** patients with ET. We analysed **222** patients with completed 3-month follow-up, excluding 7 not treated patients and 9 not occluded patients at the angiography. Since 2008 patients are increasingly selected with advanced neuroimaging, including brain CT, CT angiography, and CT perfusion. Baseline characteristics are reported in **table 1**. Intraarterial drugs were given to 95 patients (**42.8%**), see **Fig. 1**. The ET modality could enclose intra-arterial thrombolysis or mechanical approach or both. Mechanical approach was defined as mechanical thrombectomy (use of microwires and microcatheters, 1<sup>st</sup> generation stentriever, thromboaspiration, extracranial ICA stenting, 2<sup>nd</sup> generation stentriever). The subgroup of mechanical thrombectomy with use of 2<sup>nd</sup> generation stentriever was defined 'stentriever group' (n=134) and compared with 'non stentriever group' (n=88), including intra-arterial thrombolysis, and other mechanical modalities.

In the thrombectomy group (n=201) 134 patients (66.7%) were treated with 2<sup>nd</sup> generation stentriever (in order of use: Trevo<sup>®</sup>, Solitaire<sup>®</sup>, Mindframe Capture<sup>®</sup>, Revive<sup>®</sup>, Penumbra Separator 3D<sup>®</sup>, Aperio<sup>®</sup>, Catch<sup>®</sup>, Eric<sup>®</sup>). In only 4 cases 2 different stentriever were used during the same ET.

Characteristics and outcome measures of the comparison 'stentriever group' versus 'non stentriever group' were reported in **Table 2** and **Figure 2**.

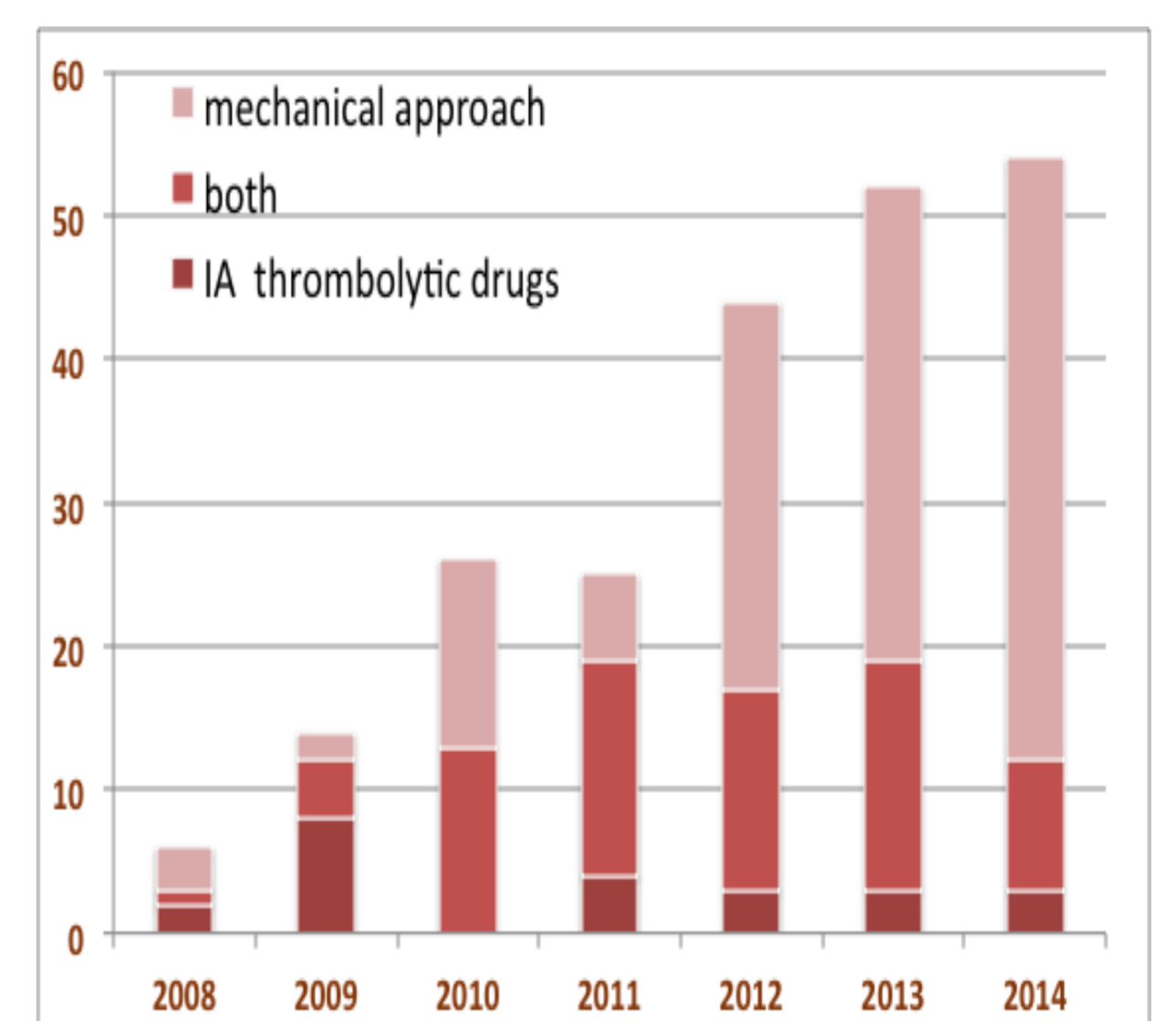
Logistic regression analysis showed lower age (p=0.000), lower baseline NIHSS (p=0.007), and reperfusion (0.001) as independent factors for good outcome.

**Table 1.** Baseline characteristics of Endovascular treatment population (n=222, total cohort)

Baseline characteristics	Endovascular treatment (n=222)
<b>Age Median</b>	71.7
< 60	48 (21.6%)
60 - 70	50 (22.5%)
70 - 80	87 (39.2%)
> 80	37 (16.7%)
<b>Gender n (%)</b>	
F	105 (47.3%)
M	117 (52.7%)
<b>baseline NIHSS Median</b>	17
<b>CT perfusion mismatch + (MTT/CBV &gt;50%)</b>	67.6%
<b>Previous IVT n (%)</b>	98 (44.3%)
<b>Onset To Groin Puncture Needle (hours) M</b>	4.5
<b>Onset To Reperfusion (hours) Median</b>	6.6
<b>Site of Occlusion n (%)</b>	
M1	78 (35.3%)
M2	26 (11.8%)
T occlusion / siphon	37 (16.7%)
extracranial ICA	44 (19.5%)
Vertebro-basilar	37 (16.7%)
<b>OUTCOME</b>	
<b>Reperfusion (TICI)</b>	
<b>TICI 2b-3 n (%)</b>	167 (75.1%)
<b>TICI</b>	
0	11 (5%)
1	12 (5.4%)
2a	32 (14.5%)
2b	49 (22.2%)
3	118 (52.9%)
<b>modified Rankin Scale at 3 months (%)</b>	
mRS 0-1	24.1%
mRS 0-2	39.1%
<b>mRS</b>	
0	22 (10%)
1	31 (14.1%)
2	33 (15%)
3	28 (12.7%)
4	34 (15.5%)
5	31 (14.1%)
<b>Mortality at 3 months n (%)</b>	42 (18.6%)
<b>COMPLICATIONS</b>	
<b>Symptomatic Hemorrhage (sICH) %</b>	9.2%
<b>SAH /dissection %</b>	5.9%

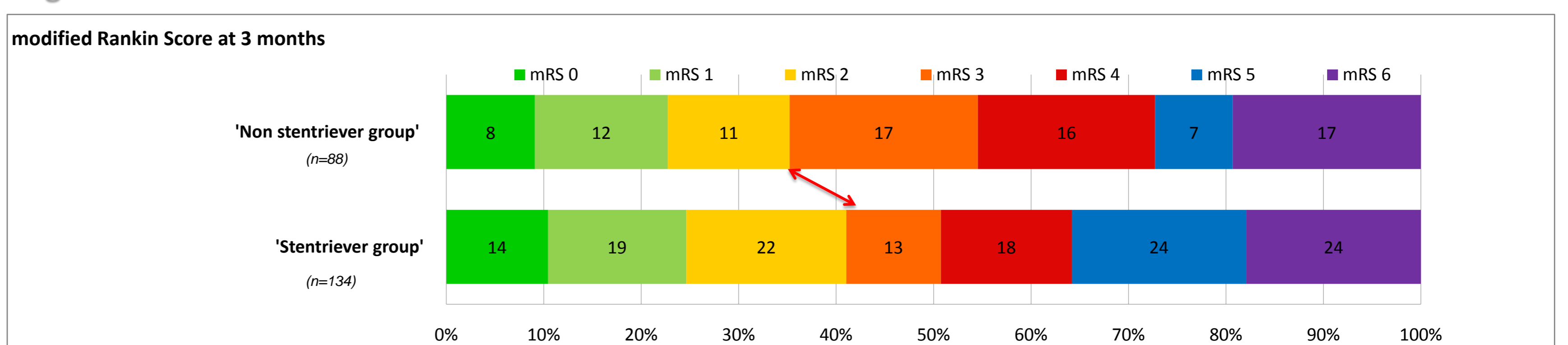
**Table 2.** Characteristics and outcome measures: comparison 'stentriever group' vs 'non stentriever group'

	Stentriever group' (n=134)	Non stentriever group' (n=88)	p
<b>Age Median</b>	71.1	72.0	ns
< 60	31 (23.1%)	17 (19.3%)	ns
60 - 70	31 (23.1%)	19 (21.6%)	ns
70 - 80	48 (35.8%)	39 (44.3%)	ns
> 80	24 (17.9%)	13 (14.8%)	ns
<b>Gender n (%)</b>			
F	70 (52.2%)	35 (39.8%)	ns
M	64 (47.8%)	53 (60.2%)	ns
<b>baseline NIHSS Median</b>	17	17	ns
<b>Previous IVT n (%)</b>	65 (48.5%)	33 (37.9%)	ns
<b>Use of IA drugs</b>	43 (32%)	52 (59.1%)	0.0001
<b>Onset To Groin puncture (hours) Median</b>	4.7	4.5	ns
<b>Onset To Reperfusion (hours) Median</b>	6.6	6.7	ns
<b>Site of Occlusion n (%)</b>			0.001
M1	58 (43.3%)	20 (23%)	
M2	12 (9%)	14 (16.1%)	
T occlusion / siphon	27 (20.1%)	10 (11.5%)	
extracranial ICA	22 (16.4%)	21 (24.1%)	
Vertebro-basilar	15 (11.2%)	22 (25.3%)	
<b>OUTCOME</b>			
<b>Reperfusion (TICI)</b>			ns
<b>TICI 2b-3 n (%)</b>	104 (77.6%)	62 (70.4%)	
<b>TICI</b>			
0	7 (5.2%)	4 (4.5%)	
1	7 (5.2%)	5 (5.7%)	
2a	16 (11.9%)	17 (19.4%)	
2b	28 (20.9%)	21 (23.8%)	
3	76 (56.7%)	41 (46.6%)	
<b>modified Rankin Scale at 3 months (%)</b>			
mRS 0-2	41%	36%	ns
<b>Mortality at 3 months n (%)</b>	17.9%	19.8%	ns
<b>COMPLICATIONS</b>			
<b>Symptomatic Hemorrhage (sICH) %</b>	11.3%	5.9%	ns
<b>SAH /dissection %</b>	6.7%	4.6%	ns



**Fig 1.** Endovascular treatment modality

**Fig 2.** mRS at 3 months: comparison 'stentriever group' vs 'non stentriever group'



## Conclusion

A national-based ET registry may provide a real-world view of safety and efficacy of ET procedures and of patient outcomes. It could improve our understanding on the appropriate selection of patients for ET, and hopefully it will allow to develop suitable treatment algorithms for a specific kind of patient.

Stentriever in ET may be useful and safe in acute ischemic patients as demonstrated in recent RCTs. In our ET open cohort in Modena the use of 2<sup>nd</sup> generation stentriever was constantly growing in last years and to date it is the current treatment of choice in ET, with or without thromboaspiration.

## References:

- Menetti F, Verganti L, Zini A, Vallone S, Carpeggiani P, Andersson T. Intra-arterial therapy as a rescue strategy after clinically failed intravenous thrombolysis may increase the likelihood of a good outcome in patients with severe ischaemic stroke. A retrospective two centre study. *Interv Neuroradiol.* 2014 May-Jun;20(3):329-35.
- Mangiafico S, Pracucci G, Saia V, Nencini P, Inzitari D, Nappini S, Vallone S, Zini et al. The Italian Registry of Endovascular Treatment in Acute Stroke: rationale, design and baseline features of patients. *Neurol Sci.* 2015 Jan 8.