

Outcome of Stent-Retriever Thrombectomy in Acute Basilar Artery Occlusion: A Clinical Registry and Meta-Analysis

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ABSTRACT

Background Basilar artery occlusion (BAO) carries high mortality and poor outcome. Early recanalization is the most powerful predictor of favorable outcome, and may be improved with mechanical thrombectomy (MT) using stent retriever devices. However, the benefit in functional outcome and safety of stent retrievers are not yet well known. The aim of this study was to assess efficacy and safety profiles of stent retriever thrombectomy in BAO stroke patients.

Methods We analyzed data retrospectively from our consecutive clinical series and conducted a systematic review and meta-analysis of all previous studies of stent retriever thrombectomy in BAO stroke patients between November 2010 and April 2014.

Results From March 2010 to March 2013, 22 patients with acute BAO were treated with Solitaire stent retriever in our series. Favorable outcome was significantly associated with younger age and distal BAO. The literature search identified 15 previous studies involving a total of 312 subjects. In the meta-analysis, including our series data, the recanalization rate (TICI score $\geq 2b$) reached 81% (95% CI 73 to 87). The rate of symptomatic intracranial hemorrhage was 4% (95% CI 2 to 8), favorable outcome (mRS ≤ 2 at 3 months) was found in 42% (95% CI 36 to 48) and mortality rate was 30% (95% CI 25 to 36).

Conclusions Stent retriever thrombectomy is a safe treatment modality for stroke patients presenting with a BAO. Although the stent retrievers showed a good recanalization rate, there are currently no randomized clinical trials to assess its clinical efficacy in comparison with the reference treatment.

OUR SERIES

Number of patients	22 (14 men)
Age, median (range)	60 (31 - 76)
Clinical presentation	
Coma	10
Mild to moderate (mean NIHSS)	12 (13.6)
IV rt-PA	36%
Thrombectomy under general anesthesia	73%
Average passage of Solitaire device (range)	1.7 (1 - 5)
Mean time to recanalization (range)	8h (2h50 - 12h45)
Underlying atherosclerotic stenosis ($\geq 70\%$)	41%
Successful recanalization (TICI $\geq 2b$)	73%
Clinical outcomes	
90-day favorable outcome (mRS ≤ 2)	27%
90-day mortality	45%
sICH at 24h	14%

FAVORABLE OUTCOME (90-day mRS ≤ 2)

- **Younger age** (47 versus 66 years; $P=0.0003$)
- **Distal third BAO location** (41% versus 0%, $P=0.05$)
- **Cardio-embolic etiology** (50% versus 20%; $P=0.29$)

SYSTEMATIC REVIEW

15 articles, a total of 312 patients (mean sample size, 21; range, 10 - 36)	
IV rt-PA (range)	38.7% (0 - 87%)
Clinical presentation (range NIHSS)	11 - 26
Mean time to recanalization (range)	8h (5h30 - 13h40)

META-ANALYSIS

	Number of studies	Number of patients	Pooled rates (95% CI)
TICI $\geq 2b$	15	312	81% (73 to 87)
90-day mRS ≤ 2	14	288	42% (36 to 48)
90-day mortality	15	312	30% (25 to 36)
sICH at 24h	14	288	4% (2 to 8)

We found no evidence of major publication and selection bias by examining the funnel plots of Freeman-Tukey transformed proportions against their standard error.

CONCLUSION

In patients presenting with an acute symptomatic BAO, stent retriever thrombectomy is a safe treatment modality for stroke patients. Although the stent retrievers showed a good recanalization rate, there are currently no randomized clinical trials to assess its clinical efficacy in comparison to rt-PA.

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